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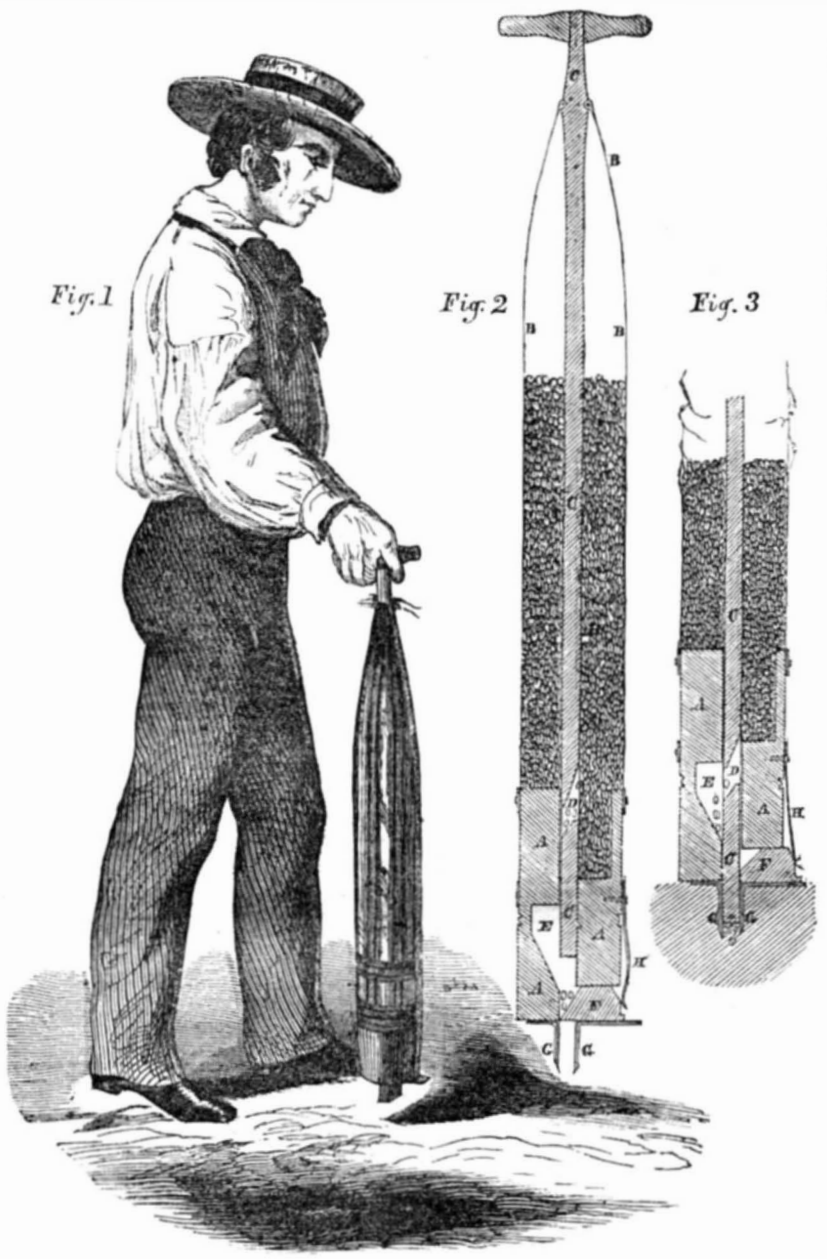
BROUGHTON'S HAND SEED PLANTER.



Broughton's Hand Seed Planter.

The accompanying engravings represent an improved Hand Seed Planter, invented by the ingenious John Broughton, of this city, whose inventions have been so often illustrated in our columns.

Fig. 1 shows the application of the implement; fig. 2 is a vertical section of it, exhibiting the seed ready to be deposited in the soil by the *planting staff*, and fig. 3 is a vertical section representing the planting staff forcing the seed into the soil; also showing how the seed passes from the tubular bag in which it is held into a small recess, to be ready for depositing in the next hill. Such imple ments are among the most useful for agricultural purposes. The great number of hand seed planters which have been brought before the public, and the wonderful variety of design evinced in their construction, afford positive proof of the importance in which they are held by our farmers and inventors, and the interest which they evince in their improvement. Simplicity, cheapness of construction, and efficiency in operating are the three grand points to be sought after in every improvement and machine. These features are clearly embraced in this planter, as will be observed by the following description.

A is a short, light, round wooden box, in which there is a small rectangular opening, for the reception and working of the planting staff. B is a tube of bagging or cloth tacked around the cylindrical box, A, and contains the seed. C is the planting staff or plunger. It is a rod of wood made rectangular where it passes through the opening in box A, and has a handle at the top, an angular opening, D, through it, and a transverse pin, H', to prevent it passing too far down. The tubular bag is tied or fastened in any convenient manner, with a cord, just below the handle, and at any point necessary for the stroke. There is a small recess, E, with an inclined bottom, in the box, A, in which there is also on opening at one side, for the reception of a stop valve, F, attached to a spring, H, rendering it self-closing. G is a short cast iron tube for making the hole in the ground; it is cast with a small plate for screwing it to the face of box, A, also forming a seat for the bottom of the stop valve, F. These are all the parts of this implement; how few and simple, and yet more efficient for the purpose designed than if they were more numerous and complicated.

Operation.—In fig. 1 the operator is represented depositing seed in a hill—the planting staff being pressed down, and the position of the parts as represented by fig. 3. The planting staff, C, in passing down, carries the proper quantity of seed with it for the next hill, the seed descending through the opening, D, in the recess, E, into box A. When the staff, C, is withdrawn in lifting it by the handle, the stop valve, F, closes the opening to tube G G, and keeps the seed as shown in fig. 2, ready for the next hill. The implement being lifted and placed on the spot for the succeeding hill, the staff, C, when pressed upon, thrusts out the stop valve, F, to the one side, and pushes the seed before it into the hole made by tube G, and thus deposits it snugly in the soil.

The person using this implement walks through the field with it in the same manner as he would with a walking cane; no other motions are executed with it than raising it by the handle when one hill is planted, and pressing it down by the handle to plant the next hill, and so on repeatedly, until the whole field is planted.

This seed planter is very compact and light, and can be operated with great ease and rapidity. It can be so cheaply constructed as to be within the reach of every man; in fact, comparing its cost with that of common hand labor, it will pay for itself in planting a single acre of corn.

For more information respecting this invention address Messrs. Broughton & Fraser, room 31, New Haven Railroad Depot Building, corner of Center and Franklin sts., this city. The patent for this planter has just been issued, and the claim will be found on another page in our regular list.

Chemical Teaching.

Arrangements have been made, it is stated, to establish a department of analytical chemistry in Union College, Schenectady, N. Y., to be under the charge of Prof. Jay; the laboratory being constructed after plans furnished by Prof. Lang, the architect of the famous laboratories of Heidelberg and Carlsruhe, Germany. The latest and best of apparatus have been obtained for the students, such as balances from Berlin, air-pump, graduated instruments for measurement of volume, and the sand bath arrangements and furnaces were copied from Liebig's new laboratory in Munich, which enable the operator to work without danger from deleterious gases. When the student is unacquainted with the re-actions of chemical substances, a systematic course of qualitative analysis, or testing, must be first undertaken; he is provided with samples of each base and acid singly, and practices the action of tests and the blow pipe upon them until the appearances prescribed become familiar. Artificially prepared mixtures of different substances are then furnished, in which he has to detect and separate each constituent; these exercises proceed from the more simple to the most complex cases. When he is able to identify any substance in a complicated mixture with ease and certainty, he proceeds to the quantitative determination of bodies. He takes carefully weighed portions of pure compounds of known composition, and determines the amount of one or more of their constituents; he thus has an exact check on the value of his results. The processes of quantitative analysis are very tedious and complicated, requiring much patience and perseverance, and involving considerable expense for the materials employed.

Window Sill Flowers.

Perhaps you are the denizen of a mighty city, and think that because you live in an atmosphere of smoke, you have no means of enjoying the beauty of "Early Flowers," but you are mistaken; true you have no "landed estate," but there is the window sill, and with a little management such a nosegay may be grown thereon as to vie with the bouquet which your opulent neighbor gathers from his garden—"a little way out of town."

What amusement is more pleasing than to tend to the growth of flowers—to watch the unfolding leaf, the opening blossom! How wonderfully is your little care repaid with exquisite forms, beautiful colors, luscious odors! Yet how many window sills in the brick forest of our cities are bare! What a pleasure it would be in walking through some of the dreary paths of this forest to see a few flowers! And it is now, because we think you really love a sight of "Nature's handy work," and look with bright eyes on the expanding buds of spring and summer flowers, that we must at once talk of committing the seeds to the earth in our window sill garden. A box in the mold to fit the window ledge is by no means expensive; indeed many of the large storekeepers will give you half a dozen boxes (such as they import ribbon in) "for a mere song," which answer very well; a slate box would be better, but these "cost money." If the flower-pot makers would manufacture a cheap porcelain trough adapted for window sill plants, what thousands would be sold! Having burnt seven or eight holes in the bottom of the box with a small red hot poker, cover each aperture with a piece of broken pot; over these, for about two inches deep, put in a layer of coarse ashes, and then fill up the box with good mold. The holes in the box and the layer of ashes always secure your ground well drained, which is of paramount importance; for plants, like animals, by no means thrive if their toes are always kept in water—this is a general rule, to which there are exceptions, like amphibious animals.

Crocuses and snowdrops, to be up early, must be put in the ground at the latter end of autumn; yet, if "earthed" on some warm winter's day, and kept sheltered, will make as good progress as those now breaking through. The wax-like auricula and the velvety polyanthus are well adapted. Tulips of all sorts must not be forgotten. The great thing in tending plants that have but a small supply of earth, is to water them regularly, but not too freely. Hyacinths will do well in pots or boxes, but if grown in water only, they should be placed in the dark for some days; this induces the growth of roots first, which is essential in order to obtain good flowers in future. SEPTIMUS PIESSE.

Coal Oil in Great Britain

Some idea of the quantity of coal oil now used in Great Britain may be formed from the statement recently made by Mr. Young, the proprietor of the Paraffine Oil Works, at Bathgate, Scotland, in a lawsuit, who testified on oath that last year he had made 400,000 gallons of lubricating oil from cannel coal, and sold it at five shillings sterling per gallon; and in answer to the question what portion of it was profit, he answered "the principal portion."

About two hundred and fifty bushels of the Chinese sugar cane have been distributed by the Patent Office this season. It is thought by many that this cane is designed to be cultivated as extensively in the United States as Indian corn.

Circulars of information in regard to making application for Patents sent free of postage. Apply at this office.

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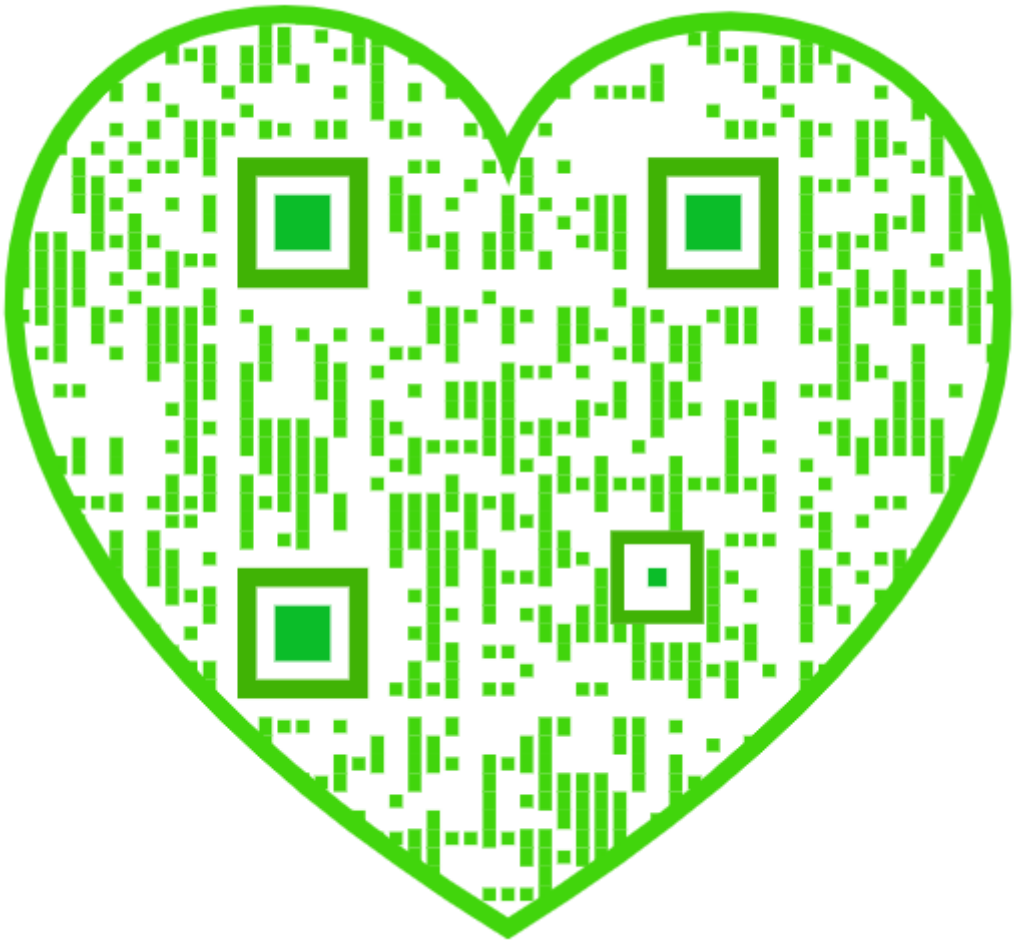

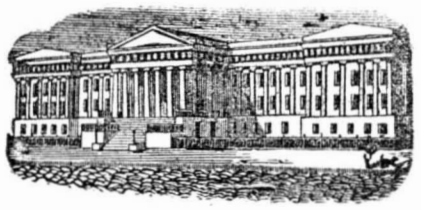

NEW AND IMPORTANT ARRANGEMENTS.

The rapid growth of our Patent Agency Business, during the past three years, has required a great addition to our ordinary facilities for its performance, and we are now able to announce the completion of a system which cannot fail to arrest the attention of all who have business of this kind to transact.

OUR PRINCIPAL OFFICE

will be, as usual, at No. 128 Fulton street, New York. There is no other city in the Union so easy of access from every quarter as this, consequently there are greater advantages in regard to the transmission of models, funds, &c, through the various channels that center in New York. Two of the partners of our firm reside here, and during the hours of business are always at hand to counsel and advise with inventors. They are assisted by a corps of skillful Examiners, who have had many years of active experience in the preparation of cases for the Patent Office.

To render our Patent Agency Department complete in every respect, we have established a

BRANCH OFFICE IN THE CITY OF WASHINGTON,

on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general care of one of the firm, assisted by experienced Examiners. The Branch Office is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington having business at the Patent Office are cordially invited to call at our office.

A SPECIAL REQUEST.

Our facilities for the speedy preparation of cases previous to the application for the patent being much more extensive in New York than at Washington, we especially require that all letters, models and remittances should be made to our address here.

EXAMINATION OF INVENTIONS.

We have been accustomed from the commencement of our business—twelve years since—to examine sketches and descriptions, and give advice in regard to the novelty of new inventions, *without charge.* We also furnish a printed circular of information to all who may wish it, giving instructions as to the proper method which should be adopted in making applications. This practice we shall still continue, and it is our purpose at all times to give such advice freely and candidly to all who apply to us. *In no case will we advise an inventor to make application unless we have confidence in his success before the Patent Office.*

Our extensive experience in mechanical and chemical improvements enables us to decide adversely to nearly one half of the cases presented to us for our opinion, before any expense has occurred in the preparation of the case for a patent.

When doubt exists in regard to the novelty of an invention, we advise in such cases a

PRELIMINARY EXAMINATION

to be made at the Patent Office. We are prepared to conduct such examinations at the Patent Office through our "Branch Agency," upon being furnished with a sketch and discription of the improvement. Our fee for this service will be $5.

After sufficient experience under this system, we confidently recommend it as a safe precautionary step in all cases before application is made for a patent—not that there will be no rejections under the system It is impossible to avoid such results in many cases, owing to the exceedingly wide range taken by the Examiners in the examination of cases; but, nevertheless, many applicants will be saved the expense of an application by adopting this course. Applicants who expect answers by mail must enclose stamps to pay return postage.

THE COSTS ATTENDING AN APPLICATION

for a Patent through our Agency are very moderate, and great care is exercised in their preparation. No cases are lost for want of care on our part in drawing up the papers, and if the claims are rejected, we enter upon a speedy examination of the reasons assigned by the Commissioner of Patents for the refusal, and make a report to our clients as to the prospects of success by further prosecution.

A circular containing fuller information respecting the method of applying for Patents can be had gratis at either of our offices.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, enclosing the official letters, &c.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard Saint Martin, Paris, and 3 Rue Therrsienne, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to inventors. Any one can take a Patent there.

Circulars of information sent free on application.

☞ Remember the SCIENTIFIC AMERICAN PATENT AGENCY, No. 128 Fulton street.

MUNN & COMPANY, Proprietors.

[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MAY 12, 1857.

WROUGHT IRON PLATE R.R. CAR WHEELS—G. W. Alden, of New York City: I do not claim the construction of railroad wheels of two wrought iron plates united with a hub, as described, or of two plates otherwise formed and united than as described.

But I claim constructing the tread and flange of the wheel, and connecting the same with the hub or center thereof, by the combination of the two plates, A and B, formed substantially as described, and uniting in the flange of the wheel, as specified.

[The two plates of which this wheel is composed are stamped out in appropriate dies for the purpose with flanges, and they are firmly united together by rivets, or their equivalents, in such a manner that a very strong and durable wheel can be manufactured at a comparatively small cost]

HEATING AND COOKING BY GAS—R. Snowden Andrews, of Baltimore, Md.: I do not claim the tubes, hh, and the hot air chamber, g, except as combined with my peculiar apparatus.

I claim the described article of manufacture, consisting of its tubes, h, hot air chamber, g, perforated rim, d, and spreading flange, C C, constructing and operating as set forth.

SELF-INDICATING BALANCE—Z. W. and Otis Avery, of Bethaney, Pa.: We claim the combination of the rolling poise, a, with the smooth beam, b, and the armature, c, operating and arranged substantially in the manner and for the purpose set forth.

SIGNAL LAMPS—R. P. Bailey, of Niagara, N. Y.: I do not claim the common globe or hand lamp, as that has been in use a long time.

But I claim the means employed to raise and lower the colored tubes, as set forth, by means of the rings and chains, H H, so constructed and attached that one tube or cylinder may play or move up and down within the other, and independent of each other, thereby allowing the different colors to be changed without obstructing each other.

ROTARY SHINGLE CUTTER—Wm Bevard, of St. Louis Mo.: I claim the combination of the described automatic feeding apparatus with the rotating shingle machine described, and also the current knife as shown at F, for the purpose specified, when combined as described.

STITCH FOR SEWING MACHINES—Chas. F. Bosworth, of Petersham, Mass.: I claim forming a stitch by passing a loop of thread taken from the opposite side through it, through any material to be sewn, and passing a loop of thread and fastening the last formed loop by passing the body of the thread upon the same side entirely through the said loop.

PORTABLE BARRACK—Matthias F. Branting, of Sangamon co., Ill.: I claim the combination of separate and detached pieces of material, as described, so as to form a barrack, which can be used for the protection of crops from the weather, and which can be readily separated again for removal from place to place, and then reconstructed.

CORN PLANTER—John Broughton, of New York City: I claim the distributing device formed of the block, A, having the opening, a, made longitudinally through it to receive the plunger, B, having the recess, H, made in it, the block being provided with the chamber, P, slide, D, and tube, E, when said distributing device, or its equivalent, is used in combination with the flexible tube or sack, J, and the whole arranged to operate as shown, for the purpose set forth.

[See illustration and description of this implement on another page.]

ROASTING MEAT—John G. Brown & John P. Derby, of South Reading, Mass.: We do not claim the use of a wheel with a socket attached, on or into which wheel a band or gears run, for the purpose of turning the spit, a device of that kind having before been used in the application of clock machinery, which is moved by a spring or weight.

Neither do we claim the various parts of the devices named, separated and disconnected from each other.

We claim a new article of manufacture, consisting of a pan with the handles, A a, sockets, B B, the removable standards, E e, ratchet wheel pawl and spit for a roasting apparatus, all arranged and operating as described.

SEED PLANTERS—John H. Bruen, of Penn Yan, N. Y.: I claim the tube, K, in combination with the bar, H, and disk distributor, E, arranged and operating in the manner and for the purpose set forth.

OVERCOMING WINDAGE IN FIREARMS—Ambrose E. Burnside, of Bristol, R. I.: First, I claim the cap or patch which covers the ball or shell, said cap not being permanently attached to the ball, substantially as set forth.

Second, I do not make the broad claim of enlarging the ball by expansive materials.

But I claim the enlarging the cannon ball or shell after it reaches the enlarged chamber of a cannon by means of a cap or patch of soft expansive material, such as leather, malleable metal, or the two combined, in order that the ball and cap together may be some larger than the bore, and therefore prevent windage in passing out of the bore, substantially as set forth, for the purposes described.

LOZENGE MACHINES—O. R. Chase, of Boston, Mass., and S. E. Chase, of Charlestown, Mass.: We claim the combination of the reducing rollers, F G, the directing and gaging rollers, D E, the endless aprons, K L, and the sugar receptacles formed by the endless aprons, the two rollers, D E, and the side plates or timbers of the frame, A, the whole being for the purpose of reducing the dough or mass of paste to an equal thickness, and applying strata of powdered sugar or material to its flat surfaces, as described.

And we also claim the striker and its operative mechanism, as combined with the cylinder, P, and made to operate in connection therewith, essentially in manner as specified, not meaning to claim a roller as combined with the cylinder for simply forcing the dough into the cutters by pressure, but a contrivance like the striker, which forces the dough into the cutters, and the latter through the dough by a blow or percussion, as described.

And in combination with the cylinder of cutters and the striker, we claim a flexible or elastic roller, T, as applied and used as specified, and for the purpose of finishing the surfaces and edges of the lozenges after the action of the striker has taken place.

And in combination with the rotary series of cutters, pistons, and scrap clearers, and their operative mechanism, we claim the two endless aprons, Q and R, for respectively receiving the waste, or scraps, and the lozenges, and conveying them out of the machine, substantially in the manner as specified.

CUTTING MATCH SPLINTS—Thos. Cook, of New York City: I claim, first, the arrangement of the block carriers, so as to have the two motions described, whereby the splints may be cut by stationary cutters, as set forth.

Second, I claim the method of supporting the block in the box by the longitudinal pressing springs, in connection with a feed follower acting therewith in conjunction therewith, as described.

ARTIFICIAL HONEY—Zenus Corbin and Gideon Marlett, of Syracuse, N. Y.: We claim as a new product or composition, artificial honey composed of the enumerated ingredients, or their equivalents, combined with each other, substantially in the manner set forth.

HORSE SHOES—David Cumming, of Sorrel Horse, Pa. f I do not claim movable calks screwed into the bottom o a horse shoe.

But I claim the false bottom or holding plate, B, constructed as described, when used in connection with the movable calks, C D E, as specified.

BRIDLE BITS—Kasson Frazer, of Syracuse, N Y.: I claim constructing cheek pieces of bridle bits by making a neck at each extremity within the ball of the mouthpiece, and securing the same therein by means of filling the chamber around the necks with metal or other composition, substantially in the manner and for the purpose set forth.

HOOK TEMPLES FOR LOOMS—Warren W. Dutcher & George Draper, of Milford, Mass.: We claim so combining with the temple and its spring a lever, or its equivalent, that just before the lay beats up it shall, by its action on such lever, cause the temple to be advanced on the cloth or towards the reed, in order that when the lay may move in the opposite direction the spring of the temple shall draw back the selvage of the cloth, so as to straighten the warp threads thereof, substantially as specified.

CORN HUSKERS—E. F. French, of Franklin, Vt.: I claim the combination of the endless aprons D, D, E, and rollers G G, two or more, covered with india rubber or other elastic material, the above parts being arranged and operating as shown and described for the purpose specified.

[The ears of corn in this machine are placed between the two aprons, which form a hopper for and rub them so as to loosen the husks. They then pass down upon one of the aprons to two toothed rollers, which strip the husks, allowing them to fall between the framing. The feeding of the ears in this machine can be rapidly performed, which is an important feature in its operation.]

PORTABLE HOUSES—Daniel Fitzgerald, of New York City: I claim, first, uniting the roof in sections, to render it portable, in the manner substantially as described.

Second, Cutting down a space in the sill, and tenoning each side, so that the door frame will set close down, and be held firm in the manner described.

SEMI-ROTATIVE STEAM ENGINES—C. B. Gallagher, of Allegheny City, Pa.: I claim the arrangement of means set forth for producing continuous rotary motion from the semi-rotative piston of the engine.

NEEDLES FOR SEWING—Benjamin Garvey, of New York City: I do not claim any peculiar process of making such needles.

Neither do I claim an open eyed needle, nor a needle with a spring attached to any part of it.

But I claim a sewing needle having a self-closed eye, with a slit leading outwardly, and made to terminate at a point more or less remote from the eye through which slit the thread may be forced into the eye, in the manner and for the purposes substantially as described.

NAIL PLATE FEEDER—J. C. Goold, of Boonton, N. J.: I claim, first, the feed rod, V, the forked spring arm, S, in combination with the feed rod, T, operating as described, and for the purpose set forth.

Second, I claim placing the ratchet cam, F', on arm, Y, for allowing it to have a forward and backward motion, also a vibrating motion, for the purpose of acoommodating itself to the movement of the nose-piece and for revolving the same, as described and set forth.

HEMP BRAKES—J. L. Hardeman, of Arrow Rock, Mo.: I do not claim broadly the invention of reciprocating slatted platforms for breaking hemp, for I am aware that they are old; an example may be seen in Walker's patent, May 27. 1851.

Nor do I claim giving a curvilinear movement to the beds of printing presses, as seen in T. H. Dodge's patent, Nov. 18, 1851. In this example the printing beds have a curvilinear movement imparted to them, similar to that given to my platforms, and by analogous means.

I do not claim this mechanical movement, but to the best of my knowledge and belief the combination of a pair of slatted platforms, c e, each of which has a curvilinear motion with an intermediate stationary platform, g, as set forth, is a new feature in hemp brakes, constitutes a new combination, and is productive of useful results

Therefore, I claim the employment, in combination with a stationary platform composed of bars, q, of a pair of curvilinear moving platforms, composed of bars, c e, as and for the purposes set forth.

[The combination of the platforms specified in this claim, it is believed, operate on the hemp in a superior manner to break and remove the woody from the fibrous parts. Improvements in the machinery for the preliminary treatment of our hemp has certainly been much required. The action of the bars, with the peculiar motions specified of the platforms in this machine, rub and break the hemp thoroughly.]

SEED PLANTERS—John Haselton, of Orford, N. H.: I do not claim the attachment to seed planters of a hind or finishing roller to press down the soil over the seed.

But I claim the arrangement of roller, F, and sliding frame, F. substantially in the manner and for the purpose described.

PROPELLER BLADES—George Hibsch, of Buffalo, N. Y.: I claim constructing propeller wheels having blades formed, substantially as described, and for the purposes set forth.

SEED PLANTERS—John Haselton, of Orford, N. H.: I do not claim the attachment to seed planters of a hind or finishing roller, to press down the soil over the seed.

But I do claim the arrangement of the roller, F, and sliding frame, F', substantially in the manner and for the purpose described.

PROPELLER BLADES—George Hibsch, of Buffalo, N Y.: I claim constructing propeller wheels having blades formed substantially as described, and for the purposes set forth.

HARVESTERS—Moses G. Hubbard, of Pen Yan, N. Y.: I claim the employment of the cogged segment, C, attached to the pole rocker in combination with the worm, P, for the purpose of elevating and depressing the frame as set forth.

HARVESTERS—Moses G. Hubbard, of Pen Yan, N. Y. I claim the combination of the shifting fork, f, short crank, d, and handle, h, or their equivalents, for throwing the machine out of or into gear, when constructed and arranged substantially as and for the purposes set forth.

PRESSES FOR COTTON, &c.—Henry Hughes, of Port Gibson, Miss.: I claim the employment of a grooved plate, D, or its equivalent, having a horizontal or other formed surface with grooves thereupon for the purpose of operating the levers, E' E', in the manner and for the purposes substantially as described.

[One end of each lever in this press is pivoted to the plunger and the other end, fitted in graduated spiral grooves made horizontally in a circular plate, whereby the pressing plunger is operated with a variable speed—fast when little power is required, such as commencing to press—and slow when great power is necessary, as the pressing proceeds. The improvement embraces a very simple means to effect these objects.]

TREATING RAW COTTON—Julius C. Hurd, of Medway, Mass.: I claim the treatment of cotton by bleaching previous to picking or carding it, for the purpose of removing the motes and trash, as set forth.

FOLDING BEDSTEADS—James A. Johnson, of Antrim, Ohio: A bedstead has been in use with joints in the end rails, having the side rails let in by a dove tail mortise, and capable of folding only the ends together, this I do not claim.

But I claim the accommodating brace, C, in combination with the stay block, D, and hinged jointed rails, B, and posts, A, for the purpose of forming an invalid or other bedstead as required, easily removed without being taken apart, either in whole or in part.

BED BOTTOMS—J. F. Keeler, of Cleveland, Ohio: I claim the eyelets, E and H, and the cords, D, with or without the springs, F F, connected with the rails and arranged in relation to the slats, B, substantially in the manner and for the purpose set forth.

LOCKS—Stuart Perry, of Newport, N. Y.: I claim operating the key tumblers or slides of locks by such an arrangement of parts within the lock that every time it is worked said tumblers or slides must, in relation to their furrings or guides, be moved by the key stem or its equivalents, beyond the limits to which the key bits move them and sufficiently beyond and with such differing distances among themselves, beyond that the limits of their full movement shall be entirely different from the limits of their partial movements in the same direction by the key-bits, thus producing false clues, and effectually destroying all true clues for picking in the ways described.

COAL STOVES—John C. Keller, of Philadelphia, Pa.: stoves provided with the hole, D, chamber, J, and perforations in the cylinder, P, some four inches below its top, are well known. I therefore do not claim the parts to which the letters, D J and P, refer.

But I claim the arrangement of the perforations, D and O, in the cylinders, B and M, situated opposite to each other, so that the current of air entering D, shall be divided and heated by passing half around the cylinder, M, previous to entering the groove, L, through the perforation, O, in the manner substantially as described.

BLACKSMITH'S STRIKER—Hartwell Kendall, of East Dorset, Vt.: I claim the use of the springs, s p s' p', when constructed, arranged, and operating in the manner and for the purpose specified.

MORTISING CHISEL—George P. Ketchum, of Bedford, Ind.: I claim the employment of the divider, D, and the shoulders, P P, in combination substantially as set forth.

JOINERS' PLANE—Benjamin J. Lane, of Newburyport, Mass.: I do not claim separately the screw rod, D, for raising and lowering the iron, C, for that has been previously used for effecting the same purpose.

But I claim the sliding plate, E, with bar, l, attached, through which the screw rod, D, passes, the plate, E, being operated by the wedge, n, and screw rod, o, substantially as described for the purpose set forth.

I also claim in combination with the plate, E, and bar, l, arranged and operated as shown, the screw rod, D, applied to the iron, C, and connected with the plate, E, and bar, l, as described, whereby the iron, C, may be adjusted or set with facility, and also secured firmly in its proper position within the plane.

[The plane iron is secured in the box of this plane in a very simple and efficient manner. It can be lowered by simply turning the screw rod, D, so that the cutting edge may have the required set, and be firmly held to the work while planing. The devices appear to be very excellent for securing and adjusting the iron in the plane stock.]

CARTRIDGES—Edward Lindmer, of New York City: I do not claim joining two metals together while one of them is in a melted state; neither do I claim a cylindrical flange of malleable material cast as above, and described by J. B. Read, in his patent of October 28th, 1856.

But I claim a cartridge in which an annular wad, and the casing to contain the powder, are formed of the materials above described and secured thereto by the act of casting the ball in the manner specified.

BORING FLUE SHEETS OF STEAM BOILERS—Sylvanus V. Lowe, of Reading, Pa.: I claim the attachment and use of mandrel, A, when constructed, arranged, and adapted to this purpose only, and made to operate in a manner as substantially described and set forth.

CLEARING GUARD OF GRAIN ELEVATORS—George Mann, Jr., of Ottawa, Ill.: I claim the sliding grate or screen, D, having its lower partcurved or bent, as shown and used in connection with the slide, C, substantially as described for the purpose set forth.

[This improvement is designed to remedy a difficulty now experienced in flouring mills, namely, the choking or clogging of the elevators with pieces of straw, chips, &c. The sliding screen, D, is placed in a frame in the grain bin, and so arranged as to prevent the matters named from entering the elevators and choking them.]

MACHINES FOR ENGRAVING CYLINDERS—Robt. Muckelt and Wm. Rigby, of Salford, Eng.: We claim, first, the levers, m and J, and the parts in combination therewith, for varying the relative proportion between the original design and that produced when applied to machinery for engraving designs on cylindrical or other surfaces.

Secondly, The ruler or guide plate, a, when used in the manner for the purposes described.

BLASTING POWDER—Antoine Murtineddu, of Marseilles, France: I claim the composition of matter herein specified.

JOINERS' BENCH STRIP—Chas. T. Pearson, of Chelsea, Mass.: I claim attaching the strip, G, to the slides, C C, which are fitted in dove-tail grooves, a, in the bars, B B, the slides, C, being provided with pawls, D, against which springs, F, act, the whole being arranged substantially as shown for the purpose set forth.

[This invention relates to the strips in joiners' benches whereby they can be readily adjusted to any desired hight to suit the width of board to be operated upon. Spring pawls take into rack teeth in the bars, B B, and hold them in position. These pawls are so arranged that they can be readily thrown out from the rack teeth and the strip adjusted with facility.]

COAL CRACKER—Townsend Poore, of Carbondale, Pa. I claim the combination of the rocking cracker, with the fixed and swinging gratings, substantially in the manner and for the purposes set forth.

DEVULCANIZING INDIA RUBBER—Conrad Poppenhusen and Ludwig Held, of Brooklyn, N. Y. Anti-dated April 1, 1857: We do not claim the treating vulcanized india rubber, gutta percha and allied gums, or their compounds with any solvents of the native gums alone, as their effect on such vulcanized gums is well known.

But we claim the process described of rendering vulcanized india rubber, gutta percha or allied gums, or their compounds soluble and plastic, by the joint action of the solvents mentioned and dry ammonia gas.

PIANOFORTE BRIDGE—T. E. Power, of Columbia, Mo.: I do not claim the bridge in the pianoforte; but I claim the cutting away the end of the bridge upon which the treble strings rest, and the supporting of the same by bars as described, in such manner as to permit a greater vibration in the surface of that part of the sound board, which is under the treble strings in the pianoforte to the end that the notes sounded by those strings may be more full and perfect in the manner described

TRAP FOR ANIMALS—Frederick Reuthe, of Hartford. Ct.: I claim the sliding and expanding spring barbed fangs, G G and H, in combination with one, two or more exploding barrels, operating in the manner and for the purpose substantially as set forth.

FOUNTAIN PENS—C. A. Rosefield, of Columbus, Ga.: I claim the detachable quill conductor, E, fitting laterally in or to a rigid upper conductor or conductor holder, arranged to freely swivel on a center pin or bearing at the bottom of or below the reservoir for action with the pen and pen holder, as shown and described.

BINDING BOOKS—A. H. Rowand, of Alleghany, Pa.: I claim the combination of the rollers in the groove or book carriage as applied to books to aid in moving them in their racks in a vertical position.

I further claim the application of the spring as above described, and used in compressing the extremities of the arch of the head band, and thereby causing said head band to maintain a circular or arch like form by means of which the leaves of a folio or book are kept from drooping or sagging when the book is in a vertical position; this spring I use according to convenience or choice, either applied on the outside of the outer back or next to the head band or inclosed between the outer and inner backs.

ROCK DRILLS—John D. Hope, of Niagara Falls, N. Y. (assignor to G. A. Gardner, of New York City: I do not claim the shaping the cutting point of the drill into the shape of the letter Z, as that form of drill has long been in use.

But I claim the formation and shaping of the wings or ridges on the transverse corners of the drill, substantially as described.

SEED PLANTERS—Charles Ketchum, (assignor to C. G. Judd,) of Penn Yan, N. Y.: I claim the blades, B, in combination with the bolts, K, in the manner and for the purpose set forth.

I also claim the adjustable cylinder, G, in combination with the band, R, and sack, o, in the manner and for the purpose specified.

SUBMARINE EXCAVATOR—Wm. Kennish, of Brooklyn, N Y., (assignor to A. B, Gray, of San Diego, Cal.) First, I claim the combination and arrangement of the chambers, 8 and 9, with their pipe, B, valves, C C, and weights, 7 7, or of any equivalents thereof, for the purposes specified.

Second, I also claim the arrangements of the cylinders N and M, with their pipes and hose, or the equivalents

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thereof, whereby the mud chamber, 9, and floating chamber, 8, are alternately filled with or emptied of air, as the means of collecting and floating off the excavated material.

I do not claim as new forming a vacuum by steam, as this has been done before.

Nor do I claim to be the first to use such vacuum for the purpose of excavation.

COPYING PRESSES—Wm. M. Smith, (assignor to himself and Peter Hanny,) of Washington, D. C.: I claim first, The levers, G, in combination with the links, C and F, arranged and operating in the manner substantially as set forth.

Secondly. The method of adjusting the platen and bed plate so as to take a book of greater or less thickness, substantially as described.

Thirdly, The slotted upright, M, on the bed plate, in combination with the arms, S, of the platen, for the purpose of preventing lateral motion, as set forth.

RAILROAD CAR BRAKES—Louis Brauer, of Sommerville, Tenn.: I lay no claim to the principle of operating railroad car brakes by means of the momentum inherent to cars when in motion.

Nor do I claim the use of an elastic substance for the purpose to diminish the effect of the push to which bumper heads are exposed when a train is stopped, as all this has been known before.

But I claim the sliding bumper, a f, in connection with clamp w, and stop-piece, Z, constructed and operating as described within.

Second, The elastic hinge, h' within the tapering sleeve, operating as described and for the purpose set forth.

PLANING CHAIR SEATS—Edward Q. Smith, of Cincinnati, O.: I do not claim broadly the shifting or lifting of cutter shafts or bearings thereof by means of cams for this is an old and well known method. Nor do I claim adjusting the table or carriage by means of wedges.

But I claim in chair seat machines the combination by means of the universally jointed shaft, L, of the feed wheel N, with the eccentric (h) when the said wheel N, derives its motion from the chair seat, substantially as and for the purposes described

[In this machine ingenious devices are so arranged that the platform on which the stuff to be planed rests is nicely adjusted to compensate for the varying thickness of the chair seat, its surface being very irregular—a good improvement.]

HEATING SOLDERING TOOLS BY GAS—J. H. Stimpson, of Boston, Mass,: I do not claim using flexible tubes or a hollow handle for heating soldering tools by gas, as this has been done before.

But I claim the perforated cylinder, E, enclosing the soldering copper, in combination with the cylinder or chamber, C C, which concentrates the heat as stated.

Second, Detaching the soldering tool, and regulating the supply of gas by compressing the pipe, G, substantially as described.

PORTABLE FIELD FENCE—Seth C. Tufts, of Mainville, O.: I claim supporting the panels vertically upon the coupling blocks, G.

I also claim providing the chairs, E, with upright cleats, d, all as described.

[The panels of this portable fence are supported vertically upon the lower coupling blocks, and the chairs are provided with vertical cleats. In all panel fences the panels are supported on tenons formed on the ends of the rails; when these decay (and they do so sooner than the rails) new rails have to be provided. No tenon rails are used in this fence, and it is cheaper, there being no waste of stuff, and also more durable than those having tenons.]

SOAP SUBSTITUTE FOR SCOURING WOOLENS—Louis Wilman, of Worcester, Mass.: I do not claim the exclusive use of bran in my composition, as this has been known.

But I claim the fulling and felting liquid composition composed of soda-ash, salt and bran, as described, for the purpose set forth.

[This liquid compound for scouring and fulling woolen cloth is now employed in several factories in New England. It does not injure the most delicate colors (scarlet or purple) of fancy kerseymeres. The cloth scoured by it is more soft and agreeable to the touch than that fulled with soap.]

PREPARING CANVAS FOR PRINTING, PAINTING, &C.—Elisha Lee, of Baltimore, Md.: I claim the composition of the described ingredients to produce an oil ground, possessing the qualities mentioned, without sizing the canvass.

GAS GENERATORS—James A. Bruce, (assignor to the Maryland Portable Gas Co.,) of Baltimore, Md.: I claim the new gas retort with smoke attachment, by which atmospheric air is admitted at the bottom to clean the retort, and purifying material by combustion, substantially as set forth and represented.

I do not intend to limit my claim to this, or any particular form of retort.

RE-ISSUE.

HANGING SHAFTS IN MILLS—Jos. Bancroft, (executor of Edward Bancroft, dec'd,) of Philadelphia, Pa. Patented Oct. 9, 1849: First, I claim in combination with the pile wire or wires for weaving piled fabrics a grooved receptacle or trough for holding said pile wire or wires in position whilst being pushed into the shed of the warps, substantially as specified.

Second, I claim pushing said pile wire or wires into the shed of the warps by a driver or pusher, substantially as specified.

Third, I claim guiding and supporting the pile wires as they are inserted into the shed of the warps by a guide or guides through, over, or on which said wires slide, substantially as specified.

[This claim and title appear to contradict each other. There is probably a mistake in connecting them together.]

Snuff Containing Lead.

MESSRS. EDITORS—As snuff is not only taken for enjoyment, but is also often recommended for the cure, or, at least, alleviation of many diseases of the eyes, we may be justified in making some remarks on this subject.

It is a fact but little known, that the use of snuff actually produces disease. Snuff often contains lead to such an extent as to produce cases of poisoning. The patients' complexion is, generally, yellowish-gray or brownish-yellow; he suffers from constipation; has, without any apparent cause, a lameness of the hands or fingers—these he cannot bend slightly without pain, and cannot stretch open at all. I was first impressed with the peculiarity of the disease, by observing that although electricity was applied thirty-seven times to the palsied parts of the hand, it did not produce the slightest effect. Two months afterwards I saw the patient again, and found, in addition to the lameness, a characteristic distortion, which confirmed my suspicions, that this was a case of lead poisoning. The diseased man was a fur trader, and so it seemed to me hardly creditable that he could have been so constantly in contact with lead as to be poisoned by it. After careful investigation, however, the cause of the disease was found out, viz., this man was in the habit of taking snuff, which, I found, contained lead. My success confirmed the correctness of this observation, for after the patient had given up his accustomed snuff, a few weeks of general treatment, connected with the use of electricity, (which, by the way, never proves very effective so long as the metal is in the system, although, in other cases of palsy of the muscles, we may attain with it truly magnificent effects,) were sufficient to effect his entire recovery. A few other cases only served to confirm my first observation.

It seems important to acquaint the large circle of your readers with the above fact, as those persons who necessarily use the hand in their work, such as artists, &c., are often inclined to resort to the use of snuff as a stimulant, and are, consequently, exposed to the danger of making themselves sick and unable to work, by using snuff poisoned with lead, as not only the lead in which the tobacco is generally packed will impregnate it, but it has been also ascertained that the liquid used in its preparation must contain lead.

N. G.

[The above article, from the pen of Dr. Glewitz, of Stratford, Conn., on one of the evils of snuff, we commend to the consideration of our snuff-taking readers. The Doctor is a sound reasoner, and upon whatever subject he writes, he first makes himself familiar with it from personal investigation.—ED.

The Cold Spring in the West.

MESSRS. EDITORS.—On the 15th, 16th, 17th, and 18th of April, 1855, we had summer heat in this county, (Lafayette, Mo.) The highest range of the mercury being from 75° to 94°.

On the same days of the present year it ranged as follows:—

April 15th, at sunrise, 19°, highest range, 40°, sky clear, wind from the north. 16th, at sunrise, 20°, highest range, 46°, cloudy afternoon, wind north. 17th, at sunrise, 34°, highest range, 34°, cloudy, wind from north-east. 18th, at sunrise, 19°, highest range, 36°, flying clouds, snow half an inch deep, and sleet on the trees. On the 17th it commenced raining moderately, and freezing at about 8 o'clock A. M., when the mercury fell to 31°, and did not vary more than half a degree until towards sunset, when it fell to 30°. So that at three o'clock it was 60° lower than it was at the same hour and day of the year in 1855. On the 18th it was 94° in 1855, which makes 58° difference.

H. POLLARD.

Lexington, Mo., May 1857.

Hollow Walls.

MESSRS. EDITORS—You have frequently referred, in your columns, to the construction of hollow brick walls for buildings, that is, with a space of from two to four inches between the inside course of brick and the outer portion of the wall. There can be no doubt or question in reference to their advantages over solid walls in the following points:—

First, A considerable saving of material over the solid wall of the same width.

Second, The prevention of dampness on the inner surface of the wall, it being a well known fact that a solid wall has to be *furred off* and lathed to prevent the condensation of the moisture in the atmosphere of the room on the cold surface of the wall, or, as it is wrongly termed, the dampness striking through. Confined air is a better non-conductor than either brick or stone, therefore the hollow walls are not only dryer, but warmer in winter and cooler in summer than solid ones.

Third, The saving of the cost of furring and lathing, the plaster being laid directly on the surface of the wall.

Fourth, Being lighter than a solid wall of the same thickness, and therefore not bearing so heavily upon the foundation.

Fifth, and mainly, In the great security against fire.

The only question that can possibly arise is, are hollow walls sufficiently strong for large buildings? That they are so for common dwellings there is no doubt, for there are many built in that way, but whether they will answer for buildings of three, four, or five stories, and so on, is not so well understood.

S. B. E.

Mansfield, Pa., May, 1857.

[We do not perceive why hollow walls cannot be constructed as strong as solid walls with the same amount of material. There is no necessity for having the hollow space more than two inches in width. In providing for a space between the inside and outer courses of a wall, our correspondent has mistaken our views if he supposes that we recommend no *binders* to be employed between the courses. The old "Flemish bond"—one brick laid longitudinally in a course (then a binder) and so on—appears to be repudiated in modern brick buildings, although it is not only the strongest, but handsomest style of laying bricks, to our notion. By building on the "Flemish bond" principle, hollow walls can be built as strong as solid ones, at least, that is our opinion.

Maple Sugar.

MESSRS. EDITORS—In an article two weeks ago, you alluded to the general sugar market being affected by the manufacture of maple sugar. There is more in your statement than may at first appear. Not many persons would realize the vast effect which this cold and tardy spring has had upon the sugar question. It has been a wonderful season for maple sugar makers. Ordinarily the season does not last longer than from two to three or three and a half weeks, but this year it actually extended to nine weeks. I think the estimate of the crop given in your quotation is too low. There has been more than 70,000,000 pounds produced in all the counties making maple sugar this year. But in taking into consideration the effect which this may produce upon the sugar market, we must recollect that in almost every case the amount stated to have been made is that which is additional to the private consumption of the family which manufacture it, hence their consumption must also be deducted from the general demand for sugar. Two years ago, there was scarcely a farmer in Chenango county who did not have to buy 150 or 200 pounds of sugar. This year I venture to affirm there are not fifty farmers in it who will buy a pound. When this is taken into account, together with the quantity of maple sugar offered or held for sale in the sixty-nine counties in the North which raise this kind of sugar extensively, it is evident that a very sensible effect must be produced upon the sugar market. Many farmers are holding back their sugar, hoping it may be kept up until fall, and then obtain an increase of price, but ere next fall we shall see a change in the sugar trade, and not on the favorable side for them.

C.

Chenango Co., N. Y., May, 1857.

[We are indebted to John Oliphant, Esq., of Cumberland, Md., for a keg of very superior maple sugar. We were not aware that this kind of sugar was made as far south as Maryland. In view of the facts now brought to our knowledge respecting the yield of maple sugar this spring, we have confidence in the statement of our correspondent that as much as 70,000,000 pounds, or 35,000 nett tuns, have been manufactured.

Velocity of Overshot Wheels.

MESSRS. EDITORS—I noticed your remarks on page 246, this Vol., SCIENTIFIC AMERICAN, a review of an article by Mr. Holmes. Whether some parties have "an axe to grind," or not, *I have none* to prompt me in relating a little practical experience. It has been the practice of some old millwrights of my acquaintance to estimate the motion of water on overshot wheels at six feet per second, and some even slower—say five feet. This may do for breast wheels under eight or ten feet head. But overshot wheels work free and easier if the velocity of the periphery is increased to eight and sometimes to nine feet per second. A case to the point was a mill some four miles distant from where I reside. When first started, it broke two sets of crown wheels, and would not do at all because it was geared too high. The wheel was an 18 feet diameter overshot. After the second "break down" new patterns were substituted, the crown wheel being increased in size, and the water wheel moving more rapidly, was then able to do one-third more work with the same amount of water used. Another mill of four runs of five feet stones which was built in 1836, or thereabouts, by Mr. J. Leroy, (Mr. Young, of Pennsylvania, millwright,) with a head and fall of 26 or 28 feet, and a wheel 25 feet in diameter. The wheel has been replaced twice since. The last time this occurred, the size of the crown wheel was increased enough to give the water wheel five revolutions in the same time that the old one made four. The result of this change was an increase of about one-fourth more work performed by the same amount of water. The more quiet water can be kept in the buckets as it descends with the wheel, the greater seems to be the power.

Batavia, N. Y., May, 1857. S. B. P.

[The old millwrights proportioned the velocity of overshot wheels to their diameters. The rule of Banks was, "the circumferences of overshot wheels should move with velocities as the square roots of their diameters"—that is, a 40 feet wheel should move twice as rapidly as a ten feet wheel. Smeaton says, "a 24 feet wheel may move at the rate of six feet per second without losing any considerable part of its power." Although Smeaton makes this admission, he recommends as a general rule a velocity of only three feet per second. In gearing water wheels so as to transmit their power to shafting, much experience is necessary. We have known of just such mistakes being committed as those mentioned by our correspondent, not only in overshot but with breast wheels also. We believe his views are right in reference to the velocity of wheels.

Gas Made from Water.

All attempts to manufacture gas from water alone have heretofore been a complete failure; Paine's gas, turpentine and water gas, water and platina gas, and many such like have all proved either impracticable or inferior to the coal and wood gas now in use. A French chemist, M. Gillard, has at last discovered and put into actual use gas made from water, not in the laboratory only, or at an exhibition, but in illuminating a whole town; the ancient city of Narbonne, France, glories in a light, the elements of which are drawn from its antique and beautiful canal, the flame looking like the electrical light, dazzling, but not tiresome, as white as can be, without vaccillation or smell; all burners being similar to so many planets.—*Courier des Etats Unis.*

[Our cotemporary appears to be highly elated with the triumphs of M. Gillard, and he has a right to be so if he uses no other gas for illumination but that obtained from water. We, however, assert that it is mistaken, unless it means that he lights that city with "Drummond lights," obtained by the gases of decomposed water, burned on balls of lime. If this is the light which is meant it will, no doubt, be very brilliant, but very expensive.

John Kepler.—His Enthusiasm.

When John Kepler discovered, after seventeen years of investigation, the third of his laws, namely, that relating to the connection between the periodic times and the distances of his planets, his delight knew no bounds. "Nothing holds me," said he; "I will indulge in my sacred fury; I will triumph over mankind by the honest confession that I have stolen the golden vases of the Egyptians to build up a tabernacle for my God, far away from the confines of Egypt. If you forgive me, I rejoice; if you are angry, I can bear it. The die is cast; the book is written, to be read either now or by posterity, I care not which. It may be well to wait a century for a reader, as God has waited six thousand years for an observer."

Iron in Blood.

We have seen a paragraph in several papers which states that "in the blood of forty-two men there is sufficient iron to make a plow-share weighing twenty-four pounds," that is, a little more than half a pound in each. We have in vain endeavored to find some good authority for such a statement. We believe it is an exaggeration.

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New Inventions.

Anti-Photographic Bank Notes.

Some of the bills belonging to banks in this city were copied so perfectly by the photographic process that they could not be detected by the bank officers. This has led the banks to issue bills with yellow colored groundwork, which cannot be so copied. The yellow or luminous ray of light, exerts no chemical action on the prepared paper of the photographic artist, therefore the yellow colored ground of a genuine bill will produce a black ground in a photographic copy.

Provost's Cotton Press.

Messrs. W. F. & C. J. Provost, of Selma, Ala., are the inventors of an improved press for which letters patent were granted on the 21st of October last. It is designed for compressing hay, cotton, or other similar material, and is represented quite fully in the accompanying engravings.

Figure 1 is a general perspective view with the side of the press box broken away to show the interior, and figure 2 an outline of a few of the parts to show how the follower is disposed of in supplying the box with new material.

This press, by an arrangement of double toggle levers, lifts up the press box and platform at the same time, and to the same extent as it depresses the follower, a very convenient and compact arrangement of the working parts, which are all of iron, and very substantially designed.

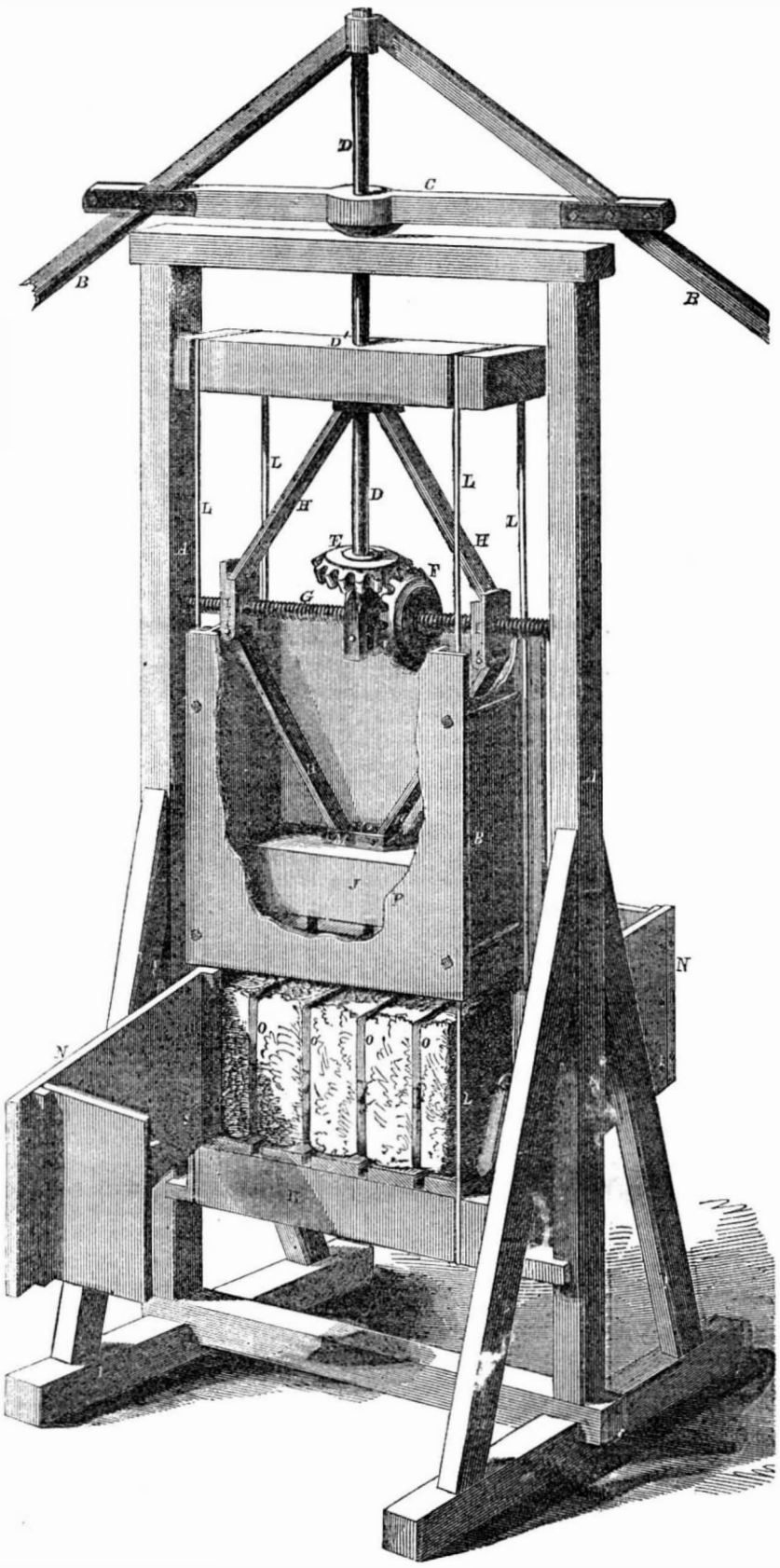
The inclined arms, B, are prolonged nearly to the ground, and are made the means by which the horses or other animals are enabled to actuate the machine. These arms are sustained by the cross brace, C, and their revolution, by the aid of the shaft, D, gives a powerful rotatory motion to the gear wheel, E. This gears into F, which latter is keyed on a strong square-threaded right and left screw, G. Two stout nuts, I, are fitted on this screw as represented, to the lower side of which are jointed by the pins, *i i*, the stout toggles, H, the other extremity of which toggles are carried in the box, M, on the back of the follower, J. In the upper side of the nuts, I I, are simple recesses as represented, in which the lower extremities of the corresponding toggles may be inserted or removed at pleasure. A stout beam, D′, across the top, guided by the passage through it of the smooth shaft, D, receives the upper set of toggles, H, and is thereby enabled to support by the rods L L L L, the press box, platform, etc., which depend below.

The platform, K, forming the bottom of the press box, P, is guided by embracing at each end the upright frame, A, as represented. The material, O, is represented as sufficiently compressed and firmly hooped with the iron bands and clasps, which are now, we believe, quite popular as fastenings for cotton bales. Doors, N, are provided on both sides to facilitate the removal of the material.

The action of the animals by revolving, G, draws the nuts, I I, together, and this raises the press box and depresses the follower, performing both these effects in a manner which is the great characteristic of the toggle, *i. e.*, with a quick motion at first, but rapidly increasing the purchase and diminishing the speed as the position of H H becomes more upright, until at the point of greatest compression—and of course greatest resistance of the material—the purchase is almost infinite. After the removal of a bale and restoration of the parts to their original positions, the follower, J, will be found a little above the top of the press box, and by disconnecting the upper set of toggles from their recesses in the nuts, the follower, with the lower toggles and the nuts still attached, may be freely turned around the screw, G, as an axis, and made to assume the position shown in figure 2, where the whole may be sustained by any convenient means. These parts are thus out of the way in refilling the press box, an operation which is performed from the back side in figure 2.

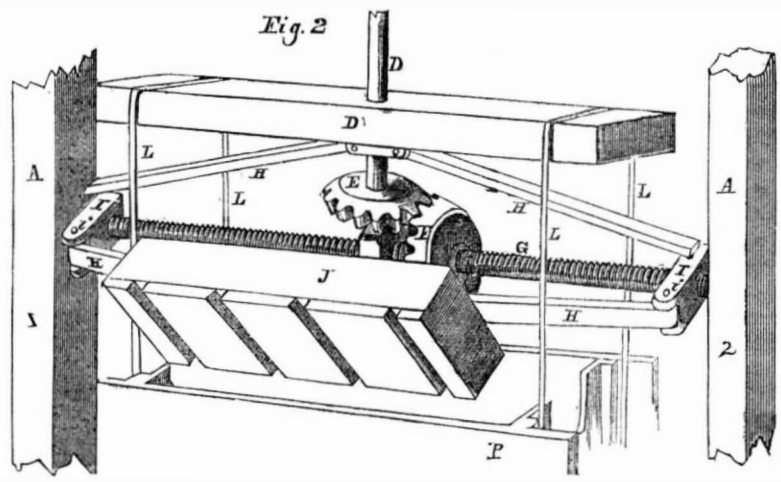
This press is very simple, powerful, and durable, and is especially intended for plan-

PROVOST'S COTTON PRESS.



tation use in compressing cotton. This highly elastic and bulky material has heretofore been usually compressed but slightly by a screw press on the plantation, and on its arrival at some important city it has to be again compressed by an hydraulic apparatus ope-

Fig. 2



rated by steam pumps. There are several large establishments in this city devoted to recompressing cotton, as the freight on this important material is thereby very considerably diminished. Messrs. Provost's press is intended to a great extent to avoid the necessity for this secondary operation by giving the bales a much denser pressure at the first operation.

Further particulars concerning this device which is already, we are informed, in quite extensive demand, may be obtained by addressing the inventors at the locality named above.

Mechanics' Club.

At the regular semi-monthly meeting of the Mechanics' Club, at the American Institute rooms in this city, on the 13th inst., Mr. W. Fields, of Wilmington, Del., exhibited and explained a model of his ingenious anti-freezing hydrant, and Mr. J P. Nelson, of Cambridgeport, Mass., his india rubber mask with breathing tubes, for a defence for firemen against smoke and flame in a burning building.

Mr. Fields' device, patented in February of the present year, causes the same movement which closes the valve necessarily to enlarge a capacious chamber below, sufficiently to draw down all the water which would otherwise remain in the standing pipe. When the hydrant is opened again this chamber is contracted by the depression of a plunger, and forces up its contents so that the water therein contained is the first to be discharged when the hydrant begins to act.

Mr. Godwin illustrated by diagram the action of a device producing the same effect in a somewhat simpler manner, invented and put in use by John D. Ames, of Yorkville, this city, not patented. It was decided that Mr. Fields' device provided more efficient packing, and was consequently better adapted to great pressures, but that in other respects Mr. Ames' was preferable.

Mr. Nelson's mask fits tightly to the head by its own contractile elasticity, and allows the wearer to inhale air through a pipe or pipes leading down his person nearly or quite to the floor, exhaling it through an aperture opposite his mouth, which is protected by a simple flap as a covering.

The London *Artizan* for this month contains a brief description of a hood and armor for enabling a person to go into a vat filled with noxious gas, or into the hold of an infected vessel, down into wells containing foul air, &c. It is thus described:—

"It consists of an india rubber hood, furnished with glass eyes, a mouth-piece, valve chamber, inhaling and exhaling tubes, wherethe wearer is cut off from the gases and foul air which surround him, and at the same time breathe fresh air through the tube carried to the external atmosphere."

A description of this apparatus was recently read before the Royal Scottish Society of Arts at Edinburgh, by John Z. Kay, of Dundee, gas engineer. We believe that this hood will accomplish the object for which it is designed; and as deaths are of frequent occurrence from persons entering gas-vats and wells for repairing and cleaning them out, we would recommend the general employment of such a hood to prevent such accidents. While we say this much respecting its usefulness, we must also positively assert that it is not a very novel invention, and that Mr. Kay is not the original inventor, although he may be, so far as his own knowledge extends. This hood is similar in every respect to one illustrated and described on page 14, Vol. 2, Scientific American, designed for the use of firemen entering houses on fire. We thus dispose of all modern claimants of this invention and presume that the members of the Mechanics' Club, as well as those of the Royal Scottish Society of Arts, will be more enlightened hereafter in reference to the question of priority in this invention.

In the course of discussion consequent on the discovery of the pre-existence of devices similar in principle to these, it was contended that a large number of inventions, which have been universally credited to English mechanics really originated elsewhere, and that the error has arisen from the English being by far the most successful in placing their inventions on permanent record in their valuable publications. The hydraulic ram was most emphatically credited to Montgolfier, of France, and the high-pressure steam engine to Oliver Evans, of our country, although parties in Great Britain patented both these improvements in that country, and have received, to some extent, the credit of being the first inventors.

Messrs. Munn & Co. respectfully announce to the public that they have established a branch of their Patent Agency in Washington City. See advertisement on another page.

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Scientific American.

NEW YORK, MAY 23, 1857.

Agricultural Machines.

Every person who has taken an interest in agriculture during the past twenty years, and who has had opportunities of becoming practically acquainted with the many new and useful machines, and improvements on old ones, which have been invented and brought into use during that period, cannot but feel deeply grateful and highly elated with the results.

Twenty years ago a good *plow* could scarcely be found from one end of the land to the other; now we manufacture, probably, the very best plows in the world. At that period a few *cultivators* had been brought into use, but the mass of farmers knew nothing about them; to-day such implements are known and employed by them all. Then some few *horse-rakes* had been introduced; but now no spirited farmer is without one. Some of our enterprising agriculturalists had then commenced to use horse-power seed-planters, but of the existence of such machines, the majority of them were entirely ignorant. Not a single mechanical *hand planter* was then employed; all such labor was executed by the hand and the hoe—tedious and troublesome operations. Now hand planters (a class of implements entirely of American origin) have become very common, and are among the most skillful and useful inventions.

Twenty years ago (although Hussey's and McCormick's patents were issued four years previously) there were not, we have been informed, more than four reaping machines in use; now they number tens of thousands, and we have introduced them into Europe, where they are effecting a revolution in the harvesting systems of the Old World, as they have done in the New. Statistics now before us of two well known reaping machines give the total number of 22,485 constructed in six years—from 1851 to 1857. We have not been able to obtain exact information on the point, but we are confident that this does not constitute one-fifth of the total number manufactured. In the State of Illinois alone, more than twenty thousand, we have been told, were employed last harvest; in 1840 not an acre of prairie had been swept by the blade of a solitary harvester. It would be an insult to the intelligence of our readers for us to add a single sentence in advocating the utility of such machines; but it affords us pleasure to quote the opinion of Mr. Mechi, the celebrated English farmer, in their favor, as a word of advice to his own countrymen. He says:—"A wise farmer will use a reaping machine. I have done so for several years, and never had any trouble with mine."

Time and space would fail us thus to go on and comment on the rise and progress of every agricultural machine in use. We have been so far specific, to lead the reader to revolve in his own mind the grand results which have been achieved by our inventors within a few brief years, in improving those machines which lie at the very foundation of our national prosperity. It is now acknowledged, in a world-wide sense, that in agricultural machinery we stand first among the nations; and to this distinction we have attained, we can safely assert, in the short space of only twenty years. In view of these facts every citizen has certainly great reason to feel "deeply grateful and highly elated."

But is there no more to be done? Have we reached the climax in the use and construction of improvements in agricultural machinery? No, far from it. A great and mighty work has yet to be accomplished before we reach a position of satisfaction regarding the general use and application of such improved machines.

The most spirited and enterprising of our agriculturalists only, have yet adopted improved machinery; their number, truly, is not small, but it is far from being large in comparison with the great mass, who still tread the old and beaten tracks. The great majority of our farmers have not yet come up to the sensible point of realizing the vast advantages that would accrue to themselves from the use of every machine that abridges their labor; they have not yet joined in the march of improvement by the adoption and use of all improved machines. We shall not feel satisfied until the good leaven has leavened the whole mass.

As caterers for the advancement of scientific and mechanical improvement for the past twelve years, it has afforded us sincere satisfaction to have been the means of bringing so many useful agricultural machines into public notice. Inventors have thus been stimulated to make new improvements; and it is a positive fact, that the unique and simple hand planter illustrated on another page was invented by one who never had planted a hill of corn in his life, and who obtained his knowledge of such implements only through our columns.

We have advocated the invention of durable and cheap portable machines, so as to bring them within the compass of every farmer's means, and great success has attended the efforts made to invent such; indeed, in this respect, our inventors have actually astonished themselves, as well as all strangers who have traveled in our country. There is no excuse now for the humblest farmer not using his best efforts to obtain labor-saving machines of all kinds for his purposes.

It has been estimated that two-thirds of our entire population are connected with agricultural pursuits. If the total number is now 28,000,000, (which cannot be far from the mark,) then no less than 18,000,000 of our people are interested in having the best agricultural machines that can be obtained.—Every farmer who has an hundred acres of land should have, at least, the following: a combined mower and reaper, a horse rake, a seed planter and sower, a thrasher and grain cleaner, a portable grist mill, corn-sheller, a horse-power, three harrows, a roller, two cultivators, and three plows. How many of our farmers have such a list of agricultural machines? Only a small number indeed, in comparison with the whole. To expect that a farm can be properly and economically cultivated and conducted without the use of a sufficient number of improved machines is presumption.

Poisonous Wall Paper.

The attention of S. N. Johnson, Professor of Analytical Chemistry in Yale College, having been directed to the above subject, by the extract from the London *Lancet*, published in our columns on page 241 of the present volume, and since copied into the New York *Tribune* and a great number of our cotemporaries, it has been the means of bringing to his knowledge a similar case which occurred at New Haven. It was that of Mr. Solomon Mead, a farmer, and at his request he has communicated the facts to the *Tribune*:

About the 1st of March last, Mr. Mead began to occupy a new house—the walls of which are built of gravel and cement—and which is heated by steam. A lower room was used by Mr. and Mrs. Mead as a sleeping apartment. After sleeping in it one night, they found themselves suffering under a strange feeling of depression, almost amounting to illness, which continued during a greater part of the day, and was renewed upon sleeping again in the room. They observed that the effects were most severe during rainy or damp weather. The room, when kept closed for some hours, acquired a disagreeable odor, which was not perceptible when the external air was allowed free access. They ceased to occupy the room, and experienced no recurrence of ill symptoms after sleeping in other parts of the same house. The cause of all this they could not divine, until the article referred to came under their observation. They saw at a glance that the symptoms there described agreed in kind with their own, and that the dangerous apartment was ornamented with a beautiful green figured paper! It only remained to discover arsenic in the green pigment to explain the cause of their suffering and indisposition. Mr. Mead brought Professor Johnson specimens of the paper, and it was but the work of a few moments to demonstrate the presence of large quantities of arsenic and of copper in the green color.

The pigment which produced the ill consequences in this paper is *Vienna green*—the most beautiful green pigment known, and is prepared with white arsenic and verdigris—two dangerous poisons. Such poisonous pigments should be prohibited by law.

Sun Flowers a Preventive of Fever and Ague.

Whether the sun flowers planted in a miasmatic situation will prevent persons who reside in the neighborhood from being affected with fever and ague or not, we personally cannot tell, but others who have tried the experiment have asserted "they will." Lieut Maury, of Washington, through the columns of the *Rural New Yorker*, has given his views on the subject. He states that he made an experiment last year with the cultivation of sun flowers as a preventive or protection against ague and fever. At the risk of spoiling a beautiful lawn, he made the gardener trench up to the depth of two a half feet a belt about forty-five feet broad around the Observatory on the marshy side, and from 150 to 200 yards from the buildings. After being well manured from the stable yard, the ground was properly prepared and planted in sun flowers in the spring of 1856. They grew finely. The sickly season was expected with more than the usual anxiety. Finally it set in, and there was *shaking* at the President's House and other places, as usual, but for the first time since the Observatory was built the watchmen about it weathered the summer clear of chills and fevers. These men, being most exposed to the night air, suffer most, and heretofore two or three relays of them would be attacked during the season; for, as one falls sick, another is employed in his place, who, in turn, being attacked, would in like manner give way to a fresh hand.

As attacks of fever and ague were more than usually prevalent in Washington last summer, it would thus appear that the sun flowers around the Observatory acted as preventatives in reference to the watchmen. In view of this fact we would advise persons who reside in the neighborhood of marshes to plant a wide strip of sun flowers between them (the marshes) and their houses. There is plenty of time for doing this the present season, and if it does no good it can do no harm. The theory of the sun flowers acting as preventives of fever and ague is, "they absorb the miasma."

Shade Trees around Dwellings.

Shade trees of houses are beautiful, but they never should be so closely planted as to exclude the bright sunshine, and thus cause dampness in the dwellings. When trees spread out their broad arms, and prevent "old Sol" from sending his cheering rays into every room in a house, their branches should be thoroughly pruned, or every intermediate tree cut down.

Dr. Hall, in his *Journal of Health*, says respecting light:—"No room without the glorious sunshine is fit for any living creature—man or beast. The glorious sunshine, the free and bounteous gift of a beneficent Creator, is the source of all buoyant, healthful life."

A correspondent of the *Southern Cultivator* states that a friend of his had a large number of the barren mulberry trees growing in his yard, and casting such a dense shade that the rays of the sun never reached the ground. He called his attention to this, and advised him to remove every alternate one. This was not done; they were allowed to stand. That season he lost his wife and three children by sickness. The correspondent referred to attributed this sickness to the dampness in and around his friend's house, caused by the deep shade of the trees. His inference is probably a correct one, for a free admission of cheering light can never be excluded from any house by shade trees (or anything else) but at the peril of health. In this place we also advise those who have shade trees around their houses to be very careful at this season to sweep up blossoms and pollen which fall upon the ground and remove them to a distance, for all decaying vegetable matter in the neighborhood of dwellings engenders miasma.

Potato Meal.

At a meeting of the Farmers' Club, of this city, on the 12th inst., M. B. Southwick, of Canada West, exhibited a preparation of potatoes dried by heated air after being boiled, which simply takes away all moisture from the pulp, leaving it in grains of the size of coarse gunpowder. He says it can be prepared for a cost of twelve cents a bushel, and reduced in bulk four-fifths. This product can be kept as easily as flour, and may be prepared ready for eating in five minutes. The process of cooking was exhibited to the Club over a spirit lamp, and the product tasted much like ordinary mashed potatoes. To prepare it for eating it is mixed with three times its bulk of hot water, and stirred until it is of the consistency of mashed potatoes. It is then set into an oven for a few minutes, when it is ready for the table. Fifteen bushels of potatoes make one barrel of this flour, which is stated to keep for years without injury in a dry place.

This is something worthy the attention of our agriculturalists. There was a tolerable good crop of potatoes in many places last year, and their price in the *fall* was moderate, but it soon rose to a very high figure, because the rot commenced among them after being stored away. Hundreds of thousands of bushels, we believe, were thus lost. Here is a method of saving potatoes from destruction by winter rot, and at the same time providing a most pleasing, healthful, and nourishing vegetable food, which should not be neglected by those who can, and who should, take advantage of it.

Antimony and its Alloys.

This metal is white and brilliant, and is principally used in the arts for making printers' type. Three parts of lead and one of antimony is a good composition of type metal. Sometimes a small quantity of tin is added, which, while it hardens the alloy, also makes it brittle, so does a small quantity of copper. When copper is mixed with antimony in excess it forms a regulus of beautiful violet color, which by the old alchemists was denominated regulus of Venus.

An amalgum of equal parts of antimony and lead, and the addition of 17 per cent of mercury can be rolled out into sheets and used for sheathing vessels. A mixture of 7 parts of antimony and 3 of iron, heated to whiteness in a crucible lined with charcoal, forms an alloy, which is very hard, slightly magnetic, and gives off sparks when filed.

The tartar emetic of pharmacy is formed of the tartrate of potash and the oxyd of antimony.

Another Universal Exhibition of Industry.

The society for the encouragement of the industrial arts in Belgium, intend to hold a Universal Exhibition—inviting all nations to be present—in the month of August next. It will be held in the old and famous city of Brussels. The rewards are to be of two kinds, viz., medals and honorable mention. We do not expect that any American manufacturers will be exhibitors; the expenses will be too great for them to compensate for any honors they might win. Quite a number of Belgian citizens were exhibitors at the Grand Exhibition here in 1853, but it did not cost them the same trouble and expense as it would our citizens to become exhibitors in Brussels, for the articles they displayed were mostly furnished by regularly established Flemish houses in this city.

The Scientific American at Reduced Prices.

Do not jump at a hasty conclusion from the above caption, for we have no intention at present of reducing the subscription price of our paper below what it now is, but we simply wish to state that we have on hand a considerable number of Vols. 6 and 7, *bound*, which we have concluded to offer at $2 each. All of the previous and several of the subsequent volumes are entirely exhausted; therefore, we are willing to dispose of Vols. 6 and 7 at the prices above named. These volumes contain a great deal of scientific information valuable and useful to all. Enclose $2 in a letter, and we will forward either by return of mail.

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The Metal Magnesium.

The following interesting article by the well known chemists, M.M. H. Sainte-Claire Deville and Caron, of Paris, is condensed from *Comptes Rendus*:—

The chemical properties of magnesium have been determined with extreme perfection by M. Bussy, to whom we owe the discovery of this metal. There exists, however, in this metal a physical property which has, as yet, been overlooked, it is a new fact in which it resembles zinc, to which it was already so closely allied. Magnesium is volatile like zinc, and nearly at the same temperature. Thirty grammes (about one ounce) have been distilled easily at a time. When the magnesium is pure it leaves no residue, and the sublimed metal is white, surrounded with a small quantity of oxyd. When it is impure it leaves a certain amount of very light black matter of a complicated nature, and then the distilled magnesium is covered over with small needle-shaped crystals, which are colorless and transparent, and which soon decompose of their own accord into ammonia and magnesia; this action indicates the probable existence of a nitride of magnesium, analogous to those remarkable bodies which Wohler and Rose have already discovered in a certain number of simple bodies.

Magnesium fuses at a temperature close approaching that at which zinc fuses. At a little higher temperature it burns with a dazzling flame, in the midst of which can be observed, from time to time, tufts of an indigo blue tint, more especially if it is burned in a jet of oxygen. The combustion of the magnesium is accompanied with all the phenomena observed in the combustion of zinc, and which denote a volatile metal, of which the oxyd is fixed and infusible.

The density of magnesium was found to be equal to 1·75; it can be filed very well, and burnishes beautifully; it keeps very well in the atmosphere when it is pure and its surface polished, but is scarcely equal to zinc in this respect.

Six hundred grammes of chloride of magnesium, prepared by the ordinary process, but with great care, are mixed with about 100 grammes of chloride of sodium, which has been previously fused, or a mixture of the chlorides of sodium and potassium and 100 grammes of pure fluoride of calcium; these are all in powder. To these are added, in small pieces, 100 grammes of sodium, and the whole, mixed intimately, is thrown into an earthenware crucible at a red heat, and afterwards covered with a lid. In a short time the action begins, and when the noise ceases the crucible is uncovered, and the melted mass stirred by means of an iron rod until it appears homogeneous; globules of magnesium are now observed, and the crucible is taken from the fire to cool. When the saline mass is about to congeal it is again agitated, and all the small particles of metal spread over it are gathered together by means of the iron rod, and formed into one piece, which is drawn on a plate of iron. The scoria or slag may be fused over again, once or even twice, and each time a small quantity of the metal is obtained from it. Six hundred grammes of chloride of magnesium acted upon by 100 grammes of sodium has yielded forty-five grammes of magnesium.

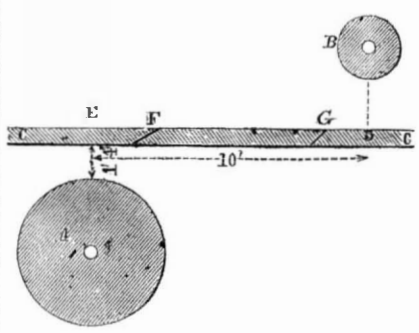
The crude magnesium is introduced into a hollow vessel coated with charcoal, and this again is placed in a tube likewise coated with charcoal, and the whole brought to a lively red, almost white, heat, while a stream of hydrogen gas is made to pass slowly through the tube, which is inclined downwards in the furnace; all the magnesium condenses just beyond the hollow vessel, and is gathered easily when the tube is cold. It is afterwards fused in a mixture of the chlorides of magnesium and sodium and fluoride of calcium.

In distilling magnesium, if the current of hydrogen is too strong, a little metallic powder is carried out of the apparatus along with the hydrogen gas. If this is ignited it burns with one of the most beautiful flames it is possible to imagine, and this experiment would make a charming exhibition for a lecture room.

Cutting Belt Holes in Floors or Partitions.

There are some who uniformly make it a practice to first cut a hole by guess, next to enlarge it on the side found necessary by trial, until a large hole is produced, and then to cover it again with a board, so that the hole finally left in the floor or partition is of the right size; but the job is very slovenly done, and the board used to cover the botch-work is a very considerable nuisance. We propose to show, by the annexed diagrams, how the work can be so marked out that each hole can be cut with certainty, exactly in the right place, of the right size, and even of exactly the proper bevel.

Let A be the pulley beneath the floor—it matters not, for our purpose, whether it be the driver or the driven—and B one above. It is desired to belt them together, while C C



is a thick and substantial floor, forbidding all communication until the belt holes are cut.

First, Plumb down from the periphery of B, and measure the distance to the surface of the floor at D,—suppose this be fourteen inches.

Second, Bore a gimlet hole at D, and measure the thickness of the floor—suppose this be three inches.

Third, Leave the point of the gimlet projecting through, and go beneath.

Fourth, Plumb up from A, and measure the hight of the lower side of the floor at E—suppose this be sixteen inches.

Fifth, Measure the horizontal distance from E to D—suppose this be ten feet.

Sixth, Now go to a clear place on the floor, or on a side wall, and draw, with the trammel or beam compass, or simply with a piece of chalk tied by a string, a circle of the same size as B.

Seventh, Measure off from the periphery of B a distance of fourteen inches.

Eighth, Draw, by means of the straight edge and square, a long straight line, at right angles to the last.

Ninth, Draw another, parallel thereto, and three inches further from B. These two lines represent the upper and lower sides of the floor.

Tenth, Measure off, from the point which represents the gimlet hole, the distance of ten feet.

Eleventh, Again lay your square, and draw a line at right angles on the side opposite to B.

Twelfth, On this lay off the sixteen inches, and represent, by a proper circle, the pulley, A. Your diagram now shows the pulleys, A and B, and the floor between them, in their true relative positions, while the gimlet hole indicates a point on the floor to measure from.

Thirteenth, Lay a straight edge alternately on each side of the two circles, in the same manner as a belt would stretch, to connect the pulleys, and mark the lines where each obliquely crosses the diagram of the floor at F and G.

Fourteenth, Measure the distance of each, from the point, D, and proceed to lay off those distances on the surface of the floor actually to be cut.

Fifteenth, Incline your auger to the same bevel as the lines of your diagram, and bore holes at the points indicated.

Sixteenth, Through these holes stretch a slender cord, and pass it round the pulleys, to test the accuracy of your work. If correct, the cords should stretch tightly through the hole without touching. But your measures will probably have been taken with some slight errors; therefore,

Seventeenth, Incline your saw to exactly the bevel indicated by the diagram, and proceed to enlarge the belt hole to the proper extent, taking care to enlarge it most in the direction indicated by the tendency of the cord, so as to correct whatever errors have been introduced by the imperfection of your diagram.

This whole operation, although it appears quite elaborate, is really very simple, and can be performed in about the same time as the reader has probably been employed in studying out our description. The diagrams may be made on a smaller scale, so as to be drawn on the drafting board if desired. But while this process would allow greater accuracy in the construction, it would also involve a liability to errors in the reducing or enlarging of the dimensions, especially if the operator is not accustomed to drafting. Either scale (the full size or a smaller) may be employed, as circumstances may dictate; and it is obvious that the same method which we have shown for cutting floors can be applied to cutting through side partitions, or inclined bulkheads, or any other obstruction. By working the same process in somewhat of a reverse direction, and laying out on the diagram of the floor the dimensions of each beam in its proper place, it is also not difficult so to locate the pulleys that the belt shall stretch clear of all such timbers, as far as it is practicable to do so. It will, of course, be borne in mind, in all these cases, that if the belt is to be deflected by a tightener, provision must be made therefor.

This simple chapter may be of considerable service to many an ingenious and skillful man, who has not had the opportunity to borrow such expedients from others by direct observation.

Another Perpetual Motion.

The editor of the Hallowell (Me.) *Gazette*, in his issue of the 9th inst., says:—"The Scientific American and other unbelieving scientific journals, as well as individuals of sceptical temperaments, will, no doubt, be astonished to know that perpetual motion has at last been demonstrated successfully, and that power sufficient for driving machinery accompanies the discovery."

We *are* astonished at this roll of Maine thunder. We have no doubt, however, but "the discovery *will be accompanied* with sufficient power (in some manner) to drive the machinery." The nature of this perpetual motion is, we are told by the *Gazette*, "the application of gravitation upon a perpetual lever." Well, this really does *astonish* us. It is far too deeply scientific for us to penetrate into its penetralia. The editor of the *Gazette* seems to have been considerably excited in composing his article. He says, "We may be considered *enthusiastic* on this subject, but we beg of the public not to condemn until they have ocular demonstration of the practical operation and value of this ingenious mechanical triumph." He also says, "This machine will inevitably produce an entire revolution in motive power."

The inventor of this perpetual motion is Cyrus Putnam, of Hallowell, who is preparing his model for exhibition at Washington. We must tell the editor of the *Gazette* that he requests too much when he so earnestly begs of the public not to condemn until they have ocular demonstration of the value of Mr. Putnam's machine. It was his duty to have the demonstration made before he said a word about it. We advise him to bring it on to this city, and set it up in the Museum alongside of Mr. Willis' perpetual motions, now on exhibition, where it will have a fair opportunity of showing its perpetual lever to the greatest gravitating advantage.

Notes on Science and Foreign Inventions.

Furnaces for Smelting Ores.—An improvement in blast furnaces for smelting ores has recently been invented by E. H. C. Moncton, of Bengal. It relates to the method of introducing the air. The sides of the furnace are surrounded with a series of tubes for the purpose of causing the air to converge from all sides upwards and downwards. The orifices of the tubes above the melted metal are larger than those in the lower portion below the surface, and the upper tubes slant in a downward direction, and cause the flame to reverberate on the mass below, thus concentrating the heat.

A similar improvement in smelting has been patented by F. Levick, of the Blaina Iron Works, Wales. He enlarges the proportions of the blasting furnace, and inserts tweers radially round the hearth, in two tiers, one above the other. The surface of the metal is enlarged, and the blast is employed at a higher pressure than is commonly used. By these improvements, it is stated that great economy in fuel is effected.

Sudden Stopping of Factory Machinery.—It is very desirable for some purposes that the machinery of a factory should be capable of as sudden stoppage as a power loom, which is arrested by the breaking of a single thread. The utility of such management of machinery was instanced at a recent Coroners' inquest, at Bradford, Eng. It was in the case of a person who was killed by machinery in one of the factories, in which, if there had been an arrangement for its sudden stoppage, the accident could have been prevented. The foreman of the jury, J. Smith, a worsted spinner, stated that in his own mill he had adopted an invention by which the entire machinery could be stopped on the very instant that danger was observed. In *this* factory, whenever an overlooker is about to repair or put on a belt, a tap on an adjoining pipe is placed in the hand of another person, which in case of danger is quickly turned, and a volume of air thrown into the condenser of the driving engine, which instantly stops it and the whole machinery.

Railroads and Locomotives.—Spain, it seems, is beginning to arouse to a sense of the importance of railroads, but she has been spurred up by those foreign to her own soil. A new railroad from the port of Santander to Alar is now being constructed, and the first section of it has recently been completed, and opened with great religious ceremonies. This railroad when completed will be eighty miles long, and has been superintended by Mr. J. Mould, an English engineer. The cuttings and embankments are of a most stupendous character. On some sections in the mountains the locomotives run at an elevation of 3,500 feet above the level of the sea.

Messrs. Sharp & Stewart, of Manchester, England, have just finished their thousandth locomotive. This is the second shop in England which has constructed a thousand locomotives, the other being a firm in Newcastle.

Great Steamship Project.—M. H. Clare, Jr., of Liverpool, proposes to build four iron steamships of 10,000 tuns burden each, as mail vessels between that city and Australia. He is prepared to have this number of such steamships constructed and ready for sea in one year, each costing $2,000,000, if the Government will guarantee to him a fair rate of postage for the service rendered. The speed of these vessels will be warranted twenty miles per hour, and the voyage only thirty days. He is confident that he can construct such vessels, so that they shall be proof against wind and water—foundering at sea—fire and shot. This is certainly a great project; but it will be wise to wait and witness what the *Great Eastern* will accomplish before measures are taken to carry it out.

Continuous Compressing Machine—T. King of London, has secured a patent for a continuous press, which consists in arranging two endless broad perforated bands of articulated links, in such a manner that while each band works around two drums, the faces of the two bands are inclined to each other at an angle in the direction of their length. The space between them is therefore of a wedge shape, and any material—hay, hemp, &c., placed between them at the wide end, will, when they move toward the narrow end, carry the article forward, and compress it gradually between them.

Fire Arm Prize—The Sardinian Government, through their Minister of War, has caused a proclamation to be issued, inviting the inventors and manufacturers of small arms throughout the world to contest for the best firearm as a war weapon. A premium of 10,000 francs wil be awarded to the party or person whose weapon shall eventually be approved by the Central Committee of Artillery, at the city of Turin, as worthy of adoption by the infantry of the line, or riflemen.

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G. B. R., of Ill.—Valves acting on the same principle as yours are found among the earliest examples of the steam engine, in historical works on the subject. We cannot say that we have seen precisely the same arrangement of passages communicating with steam and escape chests, but at any rate, your arrangement is not substantially different. Such valves have been long discarded, as they are difficult to keep tight.

J. B. & Co., of Pa.—You should have sent us a drawing of the valve itself, on a good sized scale, to enable us to understand it properly. As far as we understand it from your description and drawing, we suppose your valve to be substantially like the slide valve, except that its form and motion are made circular. If that is the case, it is not new or patentable; but if this is not the character of your valve send us a drawing or model of it, and we will express our opinion.

W. H. G., of Vt.—The subject of sewing machine patents is so complicated that it would be difficult to ascertain how many patents a machine infringed upon, and it is no part of our business to go into questions of infringement. We will inform you, however, that all needle and shuttle machines are considered to infringe on the patent of Elias Howe, Jr. It is a matter of some doubt whether your machine contains any patentable feature. There is certainly nothing patentable on the cam and lever, and we are pretty sure there is nothing in the contrivance for regulating the length. The device for keeping the thread from tangling differs very little from other means employed for the same purpose.

H. H., of N. Y.—The Pulley Engine, designed as a substitute for the crank, which created such a stir among the mechanics some years ago, you will find illustrated and described in Vol. 6, Scientific American. It has had no success. In the same volume you will find Mathiot's articles on the voltaic battery. The author has long been employed as electro-metallurgist in connection with the U. S. Coast Survey. You can gather much valuable information from these articles.

H. C., of Boston.—We cannot advise you to put a wooden cornice on a building which otherwise will be nearly fire-proof, as it may prove to be the cause of great damage to it in case of fire originating in buildings contiguous to it. An iron cornice would be much better, and the difference in cost not material, considering the damage which might arise from the cause above stated. We remember in 1852, a disastrous fire occurred in Montreal. The Bishop's church and palace, built of stone, took fire in consequence of the wooden cornices and eave troughs, and were destroyed. An iron or stone cornice would probably have saved these noble buildings.

R. P., of Ill.—In your former communication, where you used the words "manufactured article" we supposed you had reference to the machine upon which the patent existed, and not to the product of that machine. The patent is not a compound one—covering the machine and the product of that machine. For instance, butter made in a patented churn is free to be sold anywhere, and to be eaten by any one who may happen to possess it. Boards planed by a patent planing machine can be freely sold wherever purchasers can be found for them. There is no legal objection to the sale and use of satinett, although it may have been produced in a patented loom. These examples will suffice to remove your difficulty.

C. C. G., of Conn.—We do not know of one class of inventions more difficult to decide upon, when doubt exists, than the steam boiler. The reason for this is obvious, as no one subject is more important to the industrial arts therefore a great amount of ingenuity has been expended in improving it. We do not think there is any good ground to hope for a patent on your arrangement. If you will refer to page 232, Vol. 7, Scientific American, you will find a plan essentially the same as yours. The volume referred to contains a valuable history of steam boilers.

E. W. C., of Boston—A great number of patents have been granted for machines capable of sawing both sides of a marble monument at once.

C. S., of Pa.—We had not in mind at the time you mention the "Tinman's Guide," by Mr. Sheldon, or we should probably have referred to it. We cannot speak of its merits from personal knowledge.

A. S. of Pa.—Grape sugar is obtained from grapes and various fruits. It is quite different from cane sugar, and not as sweet. The crystalized portions of honey are grape sugar. By boiling a solution of cane sugar for twenty hours, part of it will be converted into grape sugar. It is not for sale by our druggists generally, but any chemist will prepare it for you. If you introduce into some starch made into paste in boiling water a little sulphuric acid, and boil the solution for six hours, the starch will be converted into grape sugar. The quantity of acid employed should be about one-eighteenth in weight that of the water.

J. D. B., of Ala.—Wash your cassimere pants in strong cold soap suds, then rinse them well in warm water to remove all the soap. They must not be rubbed on a washboard, but between the hands, or on a table with a brush, nor must they be wrung like linen. Hang them out to dry in the air. When they are dry, get them pressed by a tailor, and they will look almost as well as when new.

J. D., of N. Y.—A smoke-pipe twelve inches in diameter and thirty feet high is sufficient for a 20-horse power engine. If you use a higher chimney you will have a stronger draft in proportion to its increase of hight

G. W. Greene, of Shelburne, N. H., wants to purchase a good portable cider mill.

S. & D., of ——. The model of your steamboat propeller has been examined, and it is an old and well known device. A series of floats or paddles working upon double cranks, so that while one set is acting the other is rising out of the water, is shown in several models in the Patent Office, and on page 144, Vol. 5. Sci. Am., you will find an engraving which represents your wheel in principle.

J. C. B., of Ohio—There is no acid used in the pickle employed for hardening cast steel.

S. M., of Pa.—Vol. 6 of this paper contains a series of illustrated articles upon the science of hydrostatics which are well worthy of your attention. We cannot name any specific work which is of much value upon this subject.

E. R. C., of N. C.—The "Complete Practical Brewer," published by Henry C. Baird, of Philadelphia, contains the information you want respecting the manufacture of various kinds of beer.

G. S C., of Vt.—Printers' ink is composed of lamp black and linseed oil. The latter is boiled at a high heat, and slightly burned, and some soap is added with the lamp black.

E. B., of N. H.—The loss of power by the lateral pressure, or, in other words, the friction, of the screw propeller is variable, but is generally less than that by the plunge and lift of the paddle wheel.

R. B. B., of Ohio.—We cannot insert your inquiry in the shape you have prepared it, as it will cause the answers which may come to it to be addressed to us. This we will not permit under any circumstances—our own correspondence is as much as we can carefully attend to.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, May 16, 1857:—

C. W. C., of N. Y., $25; J. H. B., of Mich., $30; E. L. L, of N. Y., $25; C. N. L., of N. Y., $75; F. B. W., of Wis., $30; J. D. H., of Ill., $10; D. & R., of N. Y., $10; S. & T., of Conn., $30; A. C., of Ill., $35; J. B., of Ill., $55; C. C. A., of Min. Ter., $30; W. H. H., of Cal., $30; W. H. W., of N. J., $25; H. W., of Vt., $30; M. L., of N. Y., $250; P. A. S., of N. J., $30; J. S., of O., $40; G. W. B., of N. Y., $25; C. T. S., of Mass., $25; J. H. F., of Cal., $40; C. A., of Conn., $50; J. R. H., of Me., $25; J. C. M., of O., $30; H. B., of Pa., $30; J. F. T., of S. C., $30; C. B. S., of Mass., $30; H. K., of N. Y., $20.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, May 16, 1857:

H. K., of N. Y.; C. W. C., of N. Y.; E. D., of Wis.; E. L. L., of N. Y.; C. D., of N. J.; S. & B., of Vt.; L. E., of Mich.; S. & T., of Conn.; C. C. A., of Min. Ter.; J. R. H., of M C. A., of Conn., (2 cases); J. B., of N. Y.; C. T. S., of Mass.; G. W. B., of N. Y.; J. M. E, of Conn.; I. W. L., of N. Y.

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Patent Laws and Guide to Inventors.—This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office. Price 12 1-2 cents per copy. A Circular, giving instructions to inventors in regard to the size and proper construction of their models with other useful information to an applicant for a patent, is furnished gratis at this office upon application by mail.

Inventors Sending Models to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies, either through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them.

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Science and Art.

Splendid Church Clock.

Messrs. H. Sperry & Co., of this city, have just completed, for St. George's Church, (Dr. Tyng's.) a clock, which is in many respects the finest in the world. The church has two towers, and each is to show faces on three of its sides. The single clock, therefore, which is connected by a line of shafting beneath the roof, has really six external faces and twelve hands. The clock is not nearly as large in frame as the mammoth clock by Mr. Dent, in the new Houses of Parliament, London, but several of its principal parts are larger, and the mechanism, which is of the simplest possible kind, is far superior in both material and workmanship. The works of the London clock are of iron, cast with the teeth; those in this are of the best composition metal, *cut* by machinery in the most scientific form. The powerful first motion wheels of the former are 27 inches in diameter—of the latter 28 inches. The pendulum of the former is 15 feet in length—of the latter. 21 feet.

The escapement of this clock is of the form known as the pin-wheel, one of the dead beat styles. The pallets are mounted with agate. This is the same general style with which this firm have been so successful in their clocks for depots, and other situations requiring very accurate indications of time. Several new features, however, have been introduced, specially adapting the mechanism to its increased size; and much admiration is elicited by the skill and exquisite beauty of the whole. All the work is mounted and finished in the highest style known.

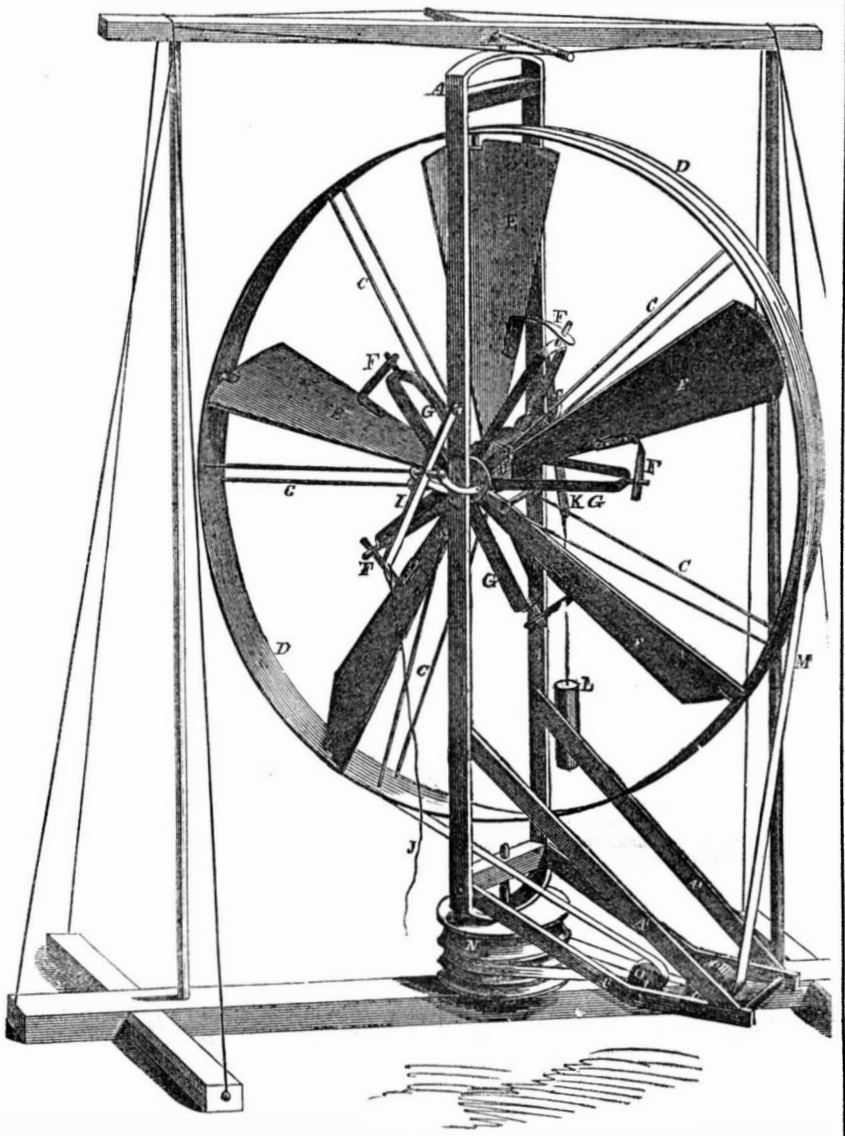
De Sendzimir's Windmill.

Wind power, unlike water power, costs nothing for inundated meadows, and subjects one to no law suits for damages. Unlike steam power it costs nothing for fuel, adds nothing to insurance premiums, and brings about no funerals by explosions. Unlike electro-magnetic and hot air engines, it will go, *sometimes*, with considerable power, and unlike these motors does not destroy itself in working except when it works too fast. The greatest objection to wind mills, of course, is their extreme reluctance to operate in a dead calm—a difficulty which even Yankee ingenuity has not yet succeeded in overcoming—but the next greatest is their violent motion in gales and their tendency to irregular starts under any circumstances, and these have to a considerable extent been obviated by a large number of very successful inventions. The accompanying illustration represents a wind mill patented by Mr. Joseph De Sendzimir, of South Oyster Bay, L. I., on the 3d of March, 1857, in which the self-regulating apparatus is very effectual and admirable, being accomplished by the almost universally adopted means of swivelling or turning the vanes, so that when revolving rapidly they present their edges to the wind at a less favorable angle.

The vanes, E, are inclosed in a ring or rim, D, of sufficient strength and accuracy of form to carry a belt, M, which after passing round the guide pulleys, O O, imparts its motion to the horizontal pulleys, N, from which its power may be transmitted with facility to any machinery which it is to impel. The pivots on which the vanes, E, are mounted do not hold them equally balanced, but gives them a tendency to turn when acted on by the wind. This tendency is resisted by the gravity of the weight, L, which weight acts on the lever, K, in such a manner as to urge the frame, G G, forward, and thus by its connection to the brackets, F, to turn the vanes in the opposite direction. By this means the wind tends always to turn them in one direction and the weight in the other, and consequently L sinks and turns them into a more favorable position whenever the wind slackens, and rises in obedience to the superior force of the wind and allows the vanes to present themselves more edgewise whenever either a sudden gust or a more permanent freshening of the breeze is experienced. The lever, I, acts on the other extremity of the frame, G, so that by pulling on the rope, J, by hand, the vanes can at any time be turned into their extreme edgewise position, and the mill stopped.

This is a very convenient self-regulating apparatus, but the chief novelty of the whole arrangement consists in its being mounted in the manner represented, in the frame, A. Windmills are usually made capable of rotation in this respect so as to present their face in the best position to the current of air, but in even the best arranged of ordinary mills the continual variations in the direction of the wind makes it impossible to adjust the position perfectly by hand, and in the self-adjusting mills the friction due to the method of mounting, and the lateral pressure of the wind prevents its attaining exactly its proper position. In Mr. De Sendzimir's mill the vertical frame, A, is mounted with perfect freedom to revolve horizontally in the strong trussed frame represented. The guide pulleys,

DE SENDZIMIR'S WINDMILL.



O O, are mounted on an arm, A′, of the frame, A, and of course necessarily revolve with it. The frame, A, is provided with a vertical vane, not represented, which acts in the ordinary manner, but with much greater effect than usual in keeping the wheel always in the right plane, to receive the full effect of the current of air. It is found by experiment that even a comparatively slight deviation from the proper position of a wind mill produces a quite sensible loss of effect, a loss which, in light winds, is quite serious. This mill turns almost frictionless, and consequently is always in very nearly its best possible position.

For further information address the inventor at South Oyster Bay, L. I.

Chemical Opinions of the National Hotel Disease.

This malady, which has excited so much and such general attention, has been made the subject of a lecture by Dr. T. Antisel, delivered before the National Institute at Washington. In it he asserted that the sickness could not have been caused by mineral poison or strychnine. The symptoms of the disease were, irritation of the mucous membrane of the stomach and alimentary canal, and great prostration accompanying the diarrhea. He believes that all the charges against filth, rats, and water, which have been made as being the source of its origin, had no foundation in fact. He examined the water and the cisterns, and found them clean. He also examined the milk used, and some fowl, (partridge,) which was a suspected cause. He examined all the liquids in the place for metallic poisons, but without success; neither antimony, arsenic, mercury, nor copper were present. None of the symptoms indicated any of the metallic poisons, excepting antimony. In conclusion he says:—

"Upon the whole, it appears that there does not seem to be any evident cause sufficient to produce this endemic. The symptoms preclude the idea of metallic poisons, or of strychnia; and since some were affected who did not meal in the house, this cause is further removed; and, finally, since chemical examinations when the disease was prevalent did not detect it, that cause must be dismissed. The symptoms also do not warrant the idea of atmospheric poisons as we at present are acquainted with them, for these, as shown, are either mephitic or miasmatic. The mephitic poisons produce asphyxia, or convulsive affections; the miasmatic poisons produce either remittant or typhoid fevers; but, as neither of these symptoms occurred, it is not fair to attribute the disease to insufficient causes.

It is not meant in this paper to exclude the *possibility* of atmospheric causes producing this disease, but simply that the causes at present attributed are insufficient to that effect.

In the absence of any immediate cause, the Board of Health have seized upon bad sewerage, and laid it down as the gravamen, recommending immediate remedy. So far well. Public health will be benefitted by it, but it will not affect the health of the National Hotel, should it be opened again, and may not prevent the recurrence of a disease of which it cannot be proved to be the cause."

This is a simple confession that Dr. Antisel knows nothing about the cause of the disease. He asserts, respecting some things to which it was attributed, and which he has investigated, that these were *not* the cause of it. "Every effect has its cause," and so had this disease; but there seems to be a vast variety of opinions as to what it is.

Literary Notices.

BIOGRAPHY OF DR. KANE—The public has become very deeply interested in whatever concerns the character and acts of the late Dr. Kane. His daring adventures are now generally known, and the great interest with which they are invested stimulate the desire to know more of the man through whose agency they were accomplished. Little is comparatively known of the private character of Dr. Kane. His acts have always stood before the man; and now that he has been gathered to his fathers we are pleased to learn that something is to be said of him as a man—a model man, truly. Dr. Wm. Elder is now preparing a complete biography, which will contain a steel engraving of Dr. Kane, from a photograph by Mr. Brady, of this city, besides other illustrations of interest. It will be furnished to subscribers at the low price of $1.50, and will be uniform with the "Arctic Explorations," and to be issued by the same publishers, Childs & Peterson, of Philadelphia. Their agents in this city are Sheldon, Blakeman & Co., Nassaust.

GRASSES AND FORAGE PLANTS—A practical treatise on the above subject by C. L. Flint, A.M., Secretary of the Massachusetts Board of Agriculture, has been published by G. P. Putnam & Co., this city. It contains the natural history, and describes the comparative nutritive value, methods of cultivating, cutting, curing, and the general management of grasses. The different grasses are illustrated with engravings; and the treatise contains more useful and scientific information on this interesting subject than any work ever issued. Every farmer should possess a copy.

GRAHAM'S ELEMENTS OF CHEMISTRY—Part Two of Vol. 2 (copyright edition) of the above able work, has just been issued by C. E. Bailliere, this city. In a brief, but comprehensive manner, eighteen of the metals, and their salts, are described and illustrated. This work needs no recommendation. Its publication has been looked for a long time by chemists; it has an established reputation. This is the second edition, enlarged and revised by H. Watts, B.A.

MUSPRATT'S CHEMISTRY—Nos. 24, 25, 26 and 27 of this unequalled encyclopædia of chemistry applied to the useful arts, have been issued by C. B. Russell & Bros., of Boston, and 290 Broadway, this city. One of the numbers contains a fine steel plate likeness of Sir Humphrey Davy. Dyeing, calico printing and electro-metalurgy are treated in these numbers.

IMPERIAL ENCYCLOPEDIA OF MACHINERY—Nos. 4, 5 and 6 of this splendid mechanical work also just issued by Messrs. Russel & Brothers, contains illustrations—working drawings—of various machines, among the number a steam engine of 120 horse power, various centrifugal pumps, screw propellers, a self acting iron planer, Ericsson's caloric engine, &c., &c. Price 50 cents per number.

BYRNE'S PRICE BOOK, READY RECKONER AND MEASURER—A very useful little work under the above name, edited by Oliver Byrne, C. E., has just been published by P. J. Cozans, No. 107 Nassau street, this city. It contains interest tables, measurements of timber, and a vast amount of useful business information. It is in pocket book form—neat and convenient.

BLACKWOOD'S MAGAZINE.—The present number of this periodical contains "The Athelings," continued, "Botany and Brigands in Greece," and seven other articles composed of essays, tales, &c.—a first-rate number. Published by Leonard Scott & Co., No. 54 Gold street, this city.

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